G8

The Book of Map Growth

Math

MommyDaily

Math Questions for the MAP Exam®
8th Grade
Algebraic Concepts - Basic
10 Questions
Quiz 1

Directions: Identify the choice that best completes the statement or answers the question.

1. Which of the following is NOT equal to 1?
   A. $(-1)^4$
   B. $(1)^3$
   C. $(-1)^5$
   D. $(-1)^0$

2. The term 3^2 is between which two numbers?
   A. 2^3 and 2^4
   B. 3^0 and 3^1
   C. 5^2 and 5^3
   D. 4^2 and 4^3

3. Evaluate: 12^0
   A. 12
   B. 0
   C. 1
   D. None of the above

4. What is the positive value of x that makes this equation true?

$$x^2 + 6x = 2(3x + 8)$$

A. x = 2
B. x = 4
C. x = 8
D. x = 6

5. Find the positive x-value that satisfies this equation.

$$p^2(p + 9) = \frac{1}{2}(18p^2 + 54)$$

A. p = 9
B. p = 3
C. p = 27
D. p = 13.5

6. Which of the following numbers has the greatest value?
A. 7.42×10^2
B. 74.2×10^3
C. 7.42×10^3
D. 742×10^1

7. Simplify the following and choose the answer that is in scientific notation.

$$(5 \times 10^6) \times (7 \times 10^{-4})$$

A. 3.5×10^3
B. 35×10^2
C. 3.5×10^1
D. 3.5×10^{-24}

8. What is the solution to $6x - 5y = -2$?
A. (3,4)
B. (-3,4)
C. (2,2)
D. (4, 3)

9. Which of the following is the equation passing through (2,-4) and (-2,8) ?
   A. $y = 4x - 8$
   B. $y = 3x - 10$
   C. $y = -3x + 2$
   D. $y = 4x + 8$

10. Sixteen is subtracted from a number. The difference is divided by 2. The quotient is 2. What is the number?
   A. 22
   B. 16
   C. 18
   D. 20

ANSWERS
Algebraic Concepts - Basic
Quiz 1

1. C $(-1)^5 = -1$; (-1 x -1) x (-1 x -1) x -1 = 1 x 1 x -1 = -1
2. A 3^2 is 9 and falls between 2^3 which is 8 and 2^4 which is 16.
3. C Any number raised to the zero power equals 1.
4. B The "6x" terms cancel out leaving $x^2 = 16$. Thus, x = 4. (x also equals -4 however we are only looking for the positive value)
5. B using the distributive property, we get $p^3 + 9p^2 = 9p^2 + 27$. The "$9p^2$" values cancel out, leaving $p^3 = 27$. Therefore, p = 3.
6. B 74.2 x 10^3 is 74,200.
7. A When multiplying in scientific notation, we add the exponents. We get 35 x 10^2 which is not in scientific notation. 3.5 x 10^3, choice A is correct.
8. A The point (3,4) is the solution to this linear equation. By substituting 3 for x and 4 for y, we get 6(3) – 5(4) = -2, 18 – 20 = -2, -2 = -2.
9. C We first find the slope as change in y divided by change in x. We get 12 divided by -4. The slope is -3. At this point, we have y = -3x + b. We use one of the given points (2,-4) and substitute into the equation. -4 = -3(2) + b. -4 = -6+b. Solving we get b =2. The equation of the line is y = -3x +2.
10. D $\frac{x-16}{2} = 2$, 20 – 16 = 4; 4 ÷ 2 = 2.

Math Questions for the MAP Exam®
8th Grade
Algebraic Concepts - Proficient
10 Questions
Quiz 1

Directions: Identify the choice that best completes the statement or answers the question.

1. Eighteen is subtracted from a number. The difference is divided by 4. The quotient is 7. What is the number?
   A. 44
   B. 46
   C. 42
   D. 31

2. Simplify the following expression

$$(a^3bc^2)^3$$

   A. $a^6b^4c^5$
   B. $a^6b^3c^5$
   C. a^9bc^6
   D. $a^9b^3c^6$

3. Which answer choice shows the following in scientific notation?

$$(6.4 \times 10^{12}) \div (3.2 \times 10^3)$$

   A. 2×10^{15}
   B. 2×10^9
   C. $.2 \times 10^8$
   D. 2×10^{10}

4. Let *P* = 22,410.014. What is the smallest power of 10 that is greater than *P*?
   A. 10^4
   B. 10^6
   C. 10^3
   D. 10^5

5. What is the value of r that satisfies this equation?

$$6^3r = 1{,}944$$

   A. 9
   B. 54
   C. 108
   D. 324

6. Which of the choices below is the simplified version of $\frac{8^3}{8^{-5}}$
   A. 8^{-15}
   B. 8^8
   C. 8^{-3}
   D. $\frac{1}{8^2}$

7. This week, Ava earned 8 dollars more than $\frac{1}{3}$ of what she earned last week. She earned $200 this week. How much did she earn last week?
   A. $624
   B. $64
   C. $576
   D. $62

8. The term 6^0 is between which 2 numbers?
   A. 2^2 and 2^3
   B. -1^3 and 2^1
   C. 3^2 and 3^3
   D. 6^1 and 6^2

9. Which of the following is not equal to -1?
   A. $(-1)^4$
   B. $(-1)^1$
   C. $(-1)^3$
   D. $(-1)^5$

10. Simplify the following and choose the answer correctly written in scientific notation.

$$(0.4 \times 10^5) \times (82 \times 10^4)$$

   A. 8.6×10^9
   B. 86×10^4
   C. 8.6×10^5
   D. 8.24×10^4

ANSWERS
Algebraic Concepts - Proficient
Quiz 1

1. B (x – 18)/4 = 7; 46 – 18 = 28, 28 ÷ 4 = 7.
2. D Each exponent is multiplied by 3 resulting in $a^9b^3c^6$.
3. B Divide 6.4 by 3.2 to get 2. The powers of 10 are subtracted: 12 – 3 = 9. This results in the final answer of 2 x 10^9.
4. D The smallest power of 10 that exceeds this number is 10^5 which equals 100,000
5. A 6^3 = 6 x 6 x 6 = 216; 216 r = 1944, r = 1944 ÷216, r = 9.
6. D Whenever you divide two or more exponents with the same base, subtract the exponents. 3 minus -5 equals 8. Therefore, the answer is 8^8.
7. C The equation is $\frac{1}{3}x + 8 = 200$ where x is the amount she earned last week. $\frac{1}{3}x$ = 192, x = 576. Ava earned $576 last week.
8. B 6^0 = 1 therefore it is between -1^3 and 2^1. $-1^3 < 6^0 < 2^1$ OR -1 < 1 < 2.
9. A $(-1)^4$ has -1 to an even exponent of 4 so it will equal a positive 1. The other exponents are odd, so they will equal -1.
10. C Multiply 0.4 x 82 = 32.8, then add the exponents $10^{5+4} = 10^9$. So, we get 32.8 x 10^9. This is not yet in scientific notation, so we need to move the decimal 1 to the left and add that to 0the exponent. 3.28 x 10^{10}

Math Questions for the MAP Exam®
8th Grade
Algebraic Concepts- Advanced
10 Questions
Quiz 1

Directions: Identify the choice that best completes the statement or answers the question.

1. Evaluate $\left(\frac{2}{3}\right)^{-2} \div \left(\frac{2}{3}\right)^{-8}$ (You may use a basic calculator.)
   A. $\frac{32}{243}$
   B. $\frac{64}{729}$
   C. $\frac{12}{18}$
   D. $\frac{2}{3}$

2. Solve and simplify $x^2 = \frac{4}{9}$
   A. $\frac{4}{9}$
   B. $\frac{2}{9}$
   C. $\frac{2}{3}$
   D. $\sqrt{\frac{4}{9}}$

3. The population of the state of Wyoming is 5.78×10^5. The population of the United States is 3.282×10^8. How many times larger is the population of the United States than the population of Wyoming? (You may use a basic calculator.)
   A. 5.67
   B. 567
   C. 56.7
   D. 5670

4. Simplify and express the result in scientific notation.

$$(2 \times 10^6) \times 0.0004$$

   A. 8×10^{2}
   B. 6×10^{-2}
   C. 8×10^{-2}
   D. 6×10^{2}

5. Which of the following solutions does NOT satisfy this equation?

$$5x - 3y = 2$$

   A. (0,0)
   B. (1,1)
   C. (7,11)
   D. (4,6)

6. Peter records his earnings and plots his earnings from the past two days on a graph. He plots (1,-2) and (5, 8). What is the equation of the line that passes through these points?
   A. $y = 8x + 5$
   B. $y = \frac{5}{2}x - \frac{9}{2}$
   C. $y = 5x - 9$
   D. $y = -2x + 2$

7. Forty-nine is subtracted from a number. The difference is divided by 11. The quotient is 3. What is the number?
   A. 92
   B. 88
   C. 91
   D. 82

8. Small boxes contain game cartridges. Large boxes contain one game console. Three boxes of consoles and 2 boxes of game cartridges weighs 50 lbs. 2 boxes of consoles and 3 boxes of game cartridges weighs 50 pounds. How much does each box weigh?
   A. The small boxes weigh 10 lbs. The large boxes weigh 10 pounds.
   B. The small boxes weigh 15 lbs. The large boxes weigh 10 pounds.
   C. The small boxes weigh 10 lbs. The large boxes weigh 15 pounds.
   D. The small boxes weigh 10 lbs. The large boxes weigh 20 pounds.

9. Simplify.

$$2x(x^2 - 5) + 10 = -10x + 130$$

   A. $\sqrt{70}$
   B. 22
   C. $\sqrt{60}$
   D. $\sqrt[3]{60}$

10. Which of the following is the simplified form of $\frac{(x^2y^4z)^3}{x^2y^6z}$
   A. $x^4y^6z^2$
   B. $x^2y^2z^2$
   C. $x^8y^{18}z^4$
   D. $x^3y^2z^3$

ANSWERS
Algebraic Concepts - Advanced
Quiz 1

1. B We subtract the exponents $(\frac{2}{3})^{-2--8}=(\frac{2}{3})^{6}$. We evaluate to get $\frac{64}{729}$.
2. C We find the square root of the 4 and the 9. $\frac{2}{3}$ is correct.
3. B Divide 3.282 by 5.78 = .567. Subtract the exponents and we get 0.567 x 10^3 This is 567.
4. A (2 x 10^{6}) x (4 x 10^{-4}); We add the exponents (6 + -4 = 2 so 10^2) And multiply 2 x 4 = 8. The answer is 8 x 10^2 .
5. A 5(0) – 3(0) = 2; 0 ≠ 2; Therefore (0,0) does not satisfy the equation.
6. B We find slope by finding the change in y/change in x. We get $\frac{5}{2}$. We then use $y = \frac{5}{2}x + b$ and substitute in point (5,8) for x and y. $8 = \frac{5}{2}(5) + b$. Solving for b = $-\frac{9}{2}$. The equation is $y = \frac{5}{2}x - \frac{9}{2}$.
7. D 82 is the number. (x - 49)/11 = 3; x – 49 = 33; x = 33 + 49; x = 82.
8. A We solve a system of equations 3x + 2y = 50 and 2x + 3y = 50. We find that y = 10. We substitute that in and find that x also equals 10. Both boxes weigh 10 pounds each.
9. D We first get $2x^3$ -10x + 10 = -10x + 130. The 10x terms cancel out. We now have $2x^3$ +10 = 130. Subtract 10. $2x^3$ = 120. Divide by 2: x^3 = 60; x = $\sqrt[3]{60}$
10. A When we have the same bases (x, y, z) in a quotient, we subtract the exponents. Before we do that, we need to simplify the numerator. Since it is a power to a power, we multiply the powers to get $x^6y^{12}z^3 \div x^2y^6z$. When we divide (subtract the exponents) we get $x^4y^6z^2$.

Math Questions for the MAP Exam®
8th Grade
Data, Statistics, and Probability - Basic
10 Questions
Quiz 1

Directions: Identify the choice that best completes the statement or answers the question.

1. Look at the table below. It organizes data based on a student's appearance on the Honor Roll and whether or not they participate in school sports. Of the total number of students, about what percentage made the Honor Roll? (You may use a basic calculator.)

Honor Roll vs Sports

	Plays Sports	Does Not Play Sports
Honor Roll Student	75	98
Not an Honor Roll Student	29	40

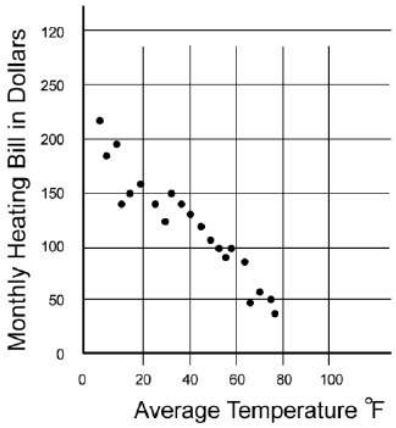
A. 70%

B. 71%

C. 68%

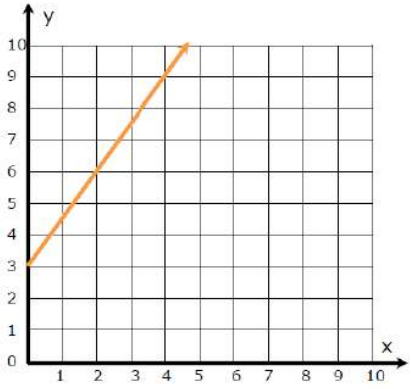
D. 72%

2. Which of the following best describes the points in the scatter plot below?



A. Increasing linear
B. Decreasing linear
C. Increasing non-linear
D. Decreasing non-linear

3. Which of the following is the slope of the line shown in the graph below?



A. The slope is 3.
B. The slope is $\frac{3}{2}$.
C. The slope is 2.
D. The slope is $\frac{2}{3}$.

4. The table below shows the number of students at Johnson Middle School who are interested in joining the school band. Which of the following shows the number of boys who do not want to join the school band?

No. Of Students	Band	No Band
No. Of Girls	55	10
No. Of Boys	35	45

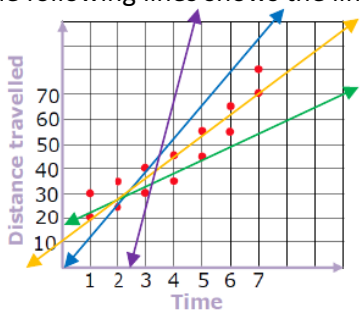
A. 45 students
B. 35 students
C. 55 students
D. 10 students

5. Look at the table below.

Drop Height	Rebound (1)	Rebound (2)
18	7	8
12	3	6
30	19	18
24	13	14
42	22	21
36	20	20
48	24	26

Is there a relationship between the height at which a ball is dropped and its 1st bounce?
A. Yes, there is a relationship.
B. No, there is not a relationship.

6. Which of the following lines shows the line of best fit for the data points in the graph?



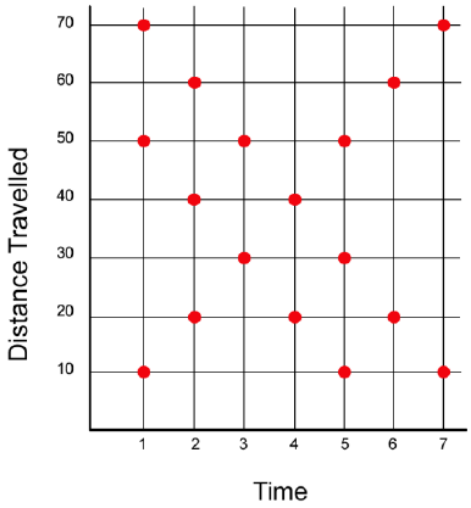
A. Purple
B. Blue
C. Yellow
D. Green

7. The table below shows the number of rich and poor people in Texas and Missouri. Which of the following shows the percentage of rich people in Missouri? Round your answer to the nearest percent. (You may use a basic calculator.)

State	Rich	Poor
Texas	405	562
Missouri	326	475

A. 42%
B. 39%
C. 40%
D. 41%

8. What kind of correlation is shown in the graph below?

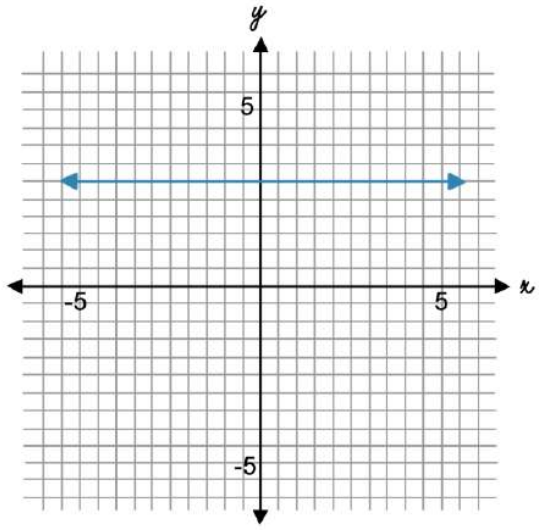


A. Positive linear correlation
B. Negative linear correlation
C. No correlation
D. Negative non-linear correlation

9. What is the slope of a line with points at (1, 4) and (-2,-2)?

A. The slope is ½.
B. The slope is 4.
C. The slope is 1.
D. The slope is 2.

10. Which of the following best represents the slope of the line in the graph below?



A. Negative
B. Positive
C. Undefined
D. Zero

ANSWERS
Data, Statistics, and Probability- Basic
Quiz 1

1. B We add up the students in the Honor Roll row and get 173. We find the total number of students which is 242. $173 \div 242 \approx 0.71$, .71 x 100 = 71%
2. B The lines in the scatter plot represent a deceasing linear correlation.
3. B The slope is found by finding the change in y/change in x or rise/run. The change (rise) in y is 3 and the change in x (run) is 2. The slope is $\frac{3}{2}$.
4. A Forty-five (45) boys did not want to join band.
5. A Yes there is a relationship. When the points are plotted, we can draw a line of best fit.
6. C The yellow line most closely matches the data points. It is the line of best fit.
7. D There are 326 rich people in Missouri out of 801 Missourians. We divide 326 by 801. We then multiply by 100 and round up to get 41%.
8. C There is no correlation among the data points in this graph.
9. D The change in y is -6. The change in x is -3. We divide these to get 2.
10. D The slope of a horizontal line is 0.

Math Questions for the MAP Exam®
8th Grade
Data, Statistics, and Probability- Proficient
10 Questions
Quiz 1

Directions: Identify the choice that best completes the statement or answers the question.

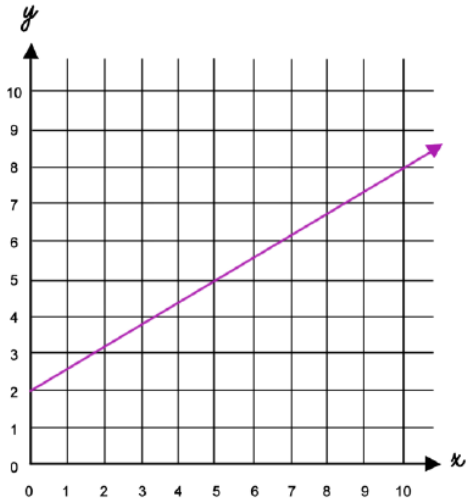
1. Look at the table below. It organizes data based on a student's appearance on the Honor Roll and whether or not they participate in school sports. Of the total number of students, about what percentage play sports, but are not on the Honor roll? (You may use a basic calculator.)

Honor Roll vs Sports

	Plays Sports	Does not play sports
Honor Roll Student	75	98
Not an Honor Roll Student	29	40

A. 16%
B. 14%
C. 10%
D. 12%

2. Which of the following is the slope of the line in the graph shown below?



A. The slope is 3.

B. The slope is $\frac{3}{5}$.

C. The slope is $\frac{5}{3}$.

D. The slope is 5.

3. The table below shows the number of students at Madison Middle School who are interested in joining the school band. Which of the following shows the percentage of boys who do not want to join the school band? Round your answer to the nearest tenth of a percent. (You may use a basic calculator.)

No. Of Students	Band	No Band
No. Of Girls	55	10
No. Of Boys	35	45

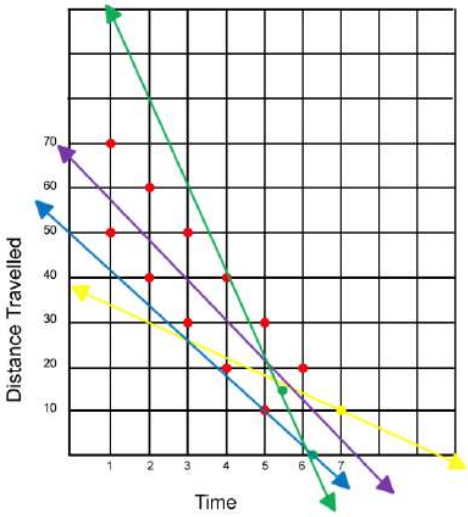
A. 45.0%

B. 57.8%

C. 55.2%

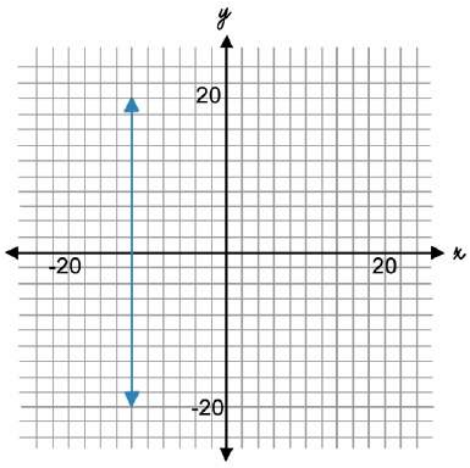
D. 56.3%

4. Which of the following lines shows the line of best fit for the data points in the graph?



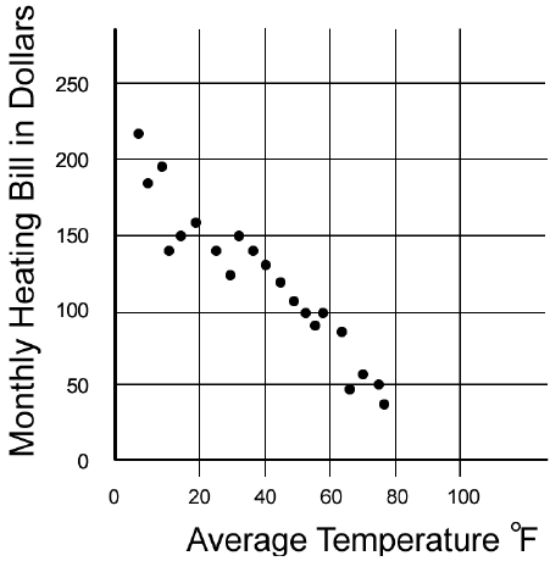
A. yellow
B. green
C. blue
D. purple

5. Which of the following best represents the slope of the line graphed below?



A. Positive
B. Negative
C. Undefined
D. Zero

6. What can be said about the correlation of the data points in the scatter plot below?



A. They have a negative linear correlation.
B. They have no correlation.
C. They have a positive non-linear correlation.
D. They have a positive correlation.

7. What is the equation of a line that passes through (-2, 3) and (-4, 10)?
A. y = $-\frac{2}{7}x + 4$
B. y = $-\frac{7}{2}x - 4$
C. $y = -\frac{7}{2}x + 2$
D. $y = -\frac{2}{7}x - 4$

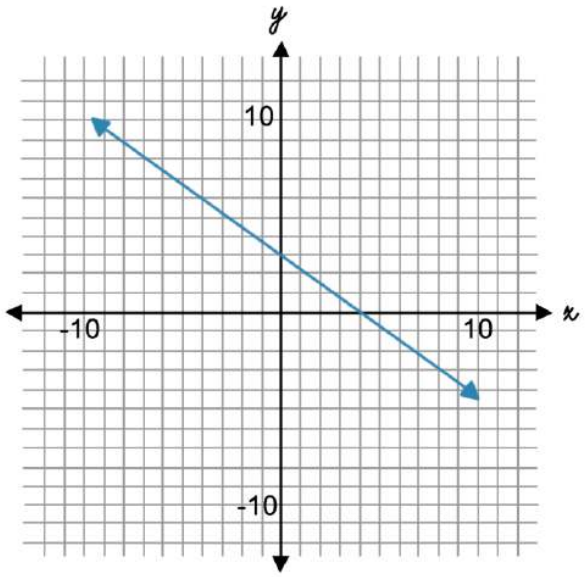
8. Which of the following is the y-intercept for a line with a slope of -3 that passes through the point (4,0)?
A. 12
B. -4
C. -12
D. 7

9. The table below shows numbers of rich and poor people in Texas and Missouri. Which of the following shows the percentage of poor people in Texas? Round your answer to the nearest percent. (You may use a basic calculator.)

State	Rich	Poor
Texas	405	562
Missouri	326	475

A. 64%
B. 60%
C. 58%
D. 57%

10. Which of the following is the equation of the line graphed below?



A. $y = -\frac{4}{3}x + 3$
B. $y = -\frac{3}{4}x + 3$
C. $y = -3x + 4$
D. $y = -4x - 3$

ANSWERS

Data, Statistics, and Probability - Proficient

Quiz 1

1. D We find the number of students that play a sport but are not on the Honor roll and get 29. We find the total number of students which is 242. 29 ÷ 242 ≈ 0.1198 or when rounded ≈ 0.12. 0.12 x 100 = 12%.
2. B The slope is calculated by finding the change in y/change in x. The change in y is 3 and the change in x is 5, making the slope $\frac{3}{5}$. Or it can be figured as rise/run which is 3/5.
3. D To find the percentage of boys, we take the number of boys that did not want to join the band (45) and divide by the total number of boys (80). We get .5625. We round to the nearest tenth of a percent to get 56.3%.
4. D The purple line most closely matches the data points. It is the line of best fit.
5. C The slope of a vertical line is always 'undefined'.
6. A The data points in the scatter plot represent a negative linear correlation.
7. B We find the slope by finding change in y (7) and dividing by change in x (-2). $\frac{10-3}{-4--2} = \frac{7}{-2}$. The slope is $-\frac{7}{2}$. We substitute in one of the (x, y) values given in the problem to find b. 10 = $\frac{7}{2}(-4) + b$. We get b = -4. The equation is y = $-\frac{7}{2}x - 4$.
8. A Using the equation y = -3x + b and substituting in (4,0) for x and y, we get 0 =-3(4) + b. Solving for b we get 12. The equation is y = -3x + 12. The letter b represents the y intercept; therefore, the y-intercept is 12.
   Choice A is correct.
9. C There are 562 poor people in Texas out of 967 Texans. 532/967 ≈ 0.5811. When rounded to the nearest percent it equals 58%.
10. B The line has a y-intercept at (0,3) and also passes through (4,0). We find the slope by dividing change in y (-3) by change in x (4) or rise/run (-3/4). The y-intercept is the b of the equation so b = 3 We now know $y = -\frac{3}{4}x + 3$ is the equation of this line.

Math Questions for the MAP Exam®
8th Grade
Data, Statistics, and Probability- Advanced
10 Questions
Quiz 1

Directions: Identify the choice that best completes the statement or answers the question.

1. The table below shows the number of students at Johnson Middle School who are interested in joining the school band. Which of the following shows the percentage of students who do not want to join the school band? Round your answer to the nearest tenth of a percent. (You may use a basic calculator.)

   A. 37.9%
   B. 55.0%
   C. 38.2%
   D. 35.1%

2. Assume a cell phone plan costs $20 per month. The phone company also charges $.08 per minute. This is a linear relationship. Which of the following equations represents the relationship of total cost(c) to number of minutes(m) used?
   A. c = m(20 + .08)
   B. c = 20m + .08
   C. m = .08c + 20
   D. c = .08m + 20

3. Using the information from the question above, what is the slope and y-intercept of the line representing this relationship?
   A. The slope is .08 and the y-intercept is 20.
   B. The slope is 20 and the y-intercept is .08.
   C. The slope is -20 and the y-intercept is .08.
   D. The slope is .08 and the y-intercept is 0.

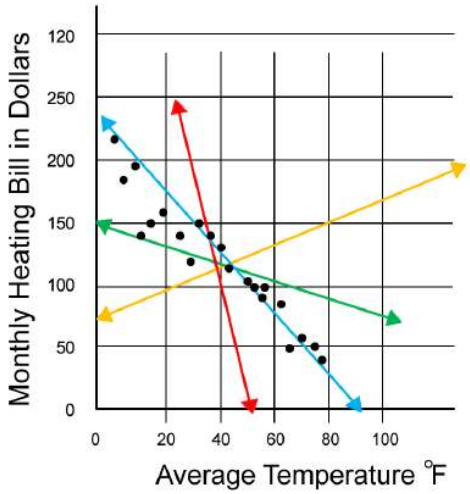
4. Look at the table below. It organizes data based on a student's appearance on the Honor Roll and whether or not they participate in school sports. What percentage of athletes are on the Honor Roll? (You may use a basic calculator.)

Honor Roll vs Sports

	Plays Sports	Does not play sports
Honor Roll Student	75	98
Not an Honor Roll Student	29	40

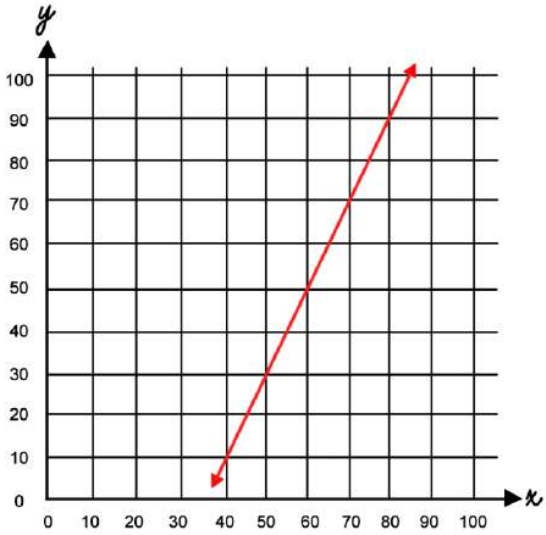
   A. 75%
   B. 74%
   C. 72%
   D. 70%

5. Which of the following represents the line of best fit in the scatter plot below?



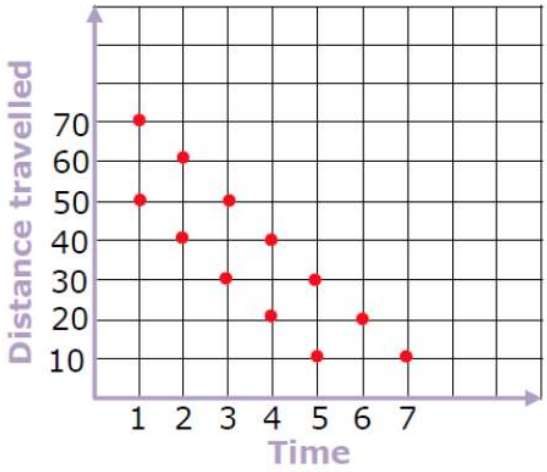
   A. Red
   B. Yellow
   C. Blue
   D. Green

6. Which of the following is the equation of the line shown?



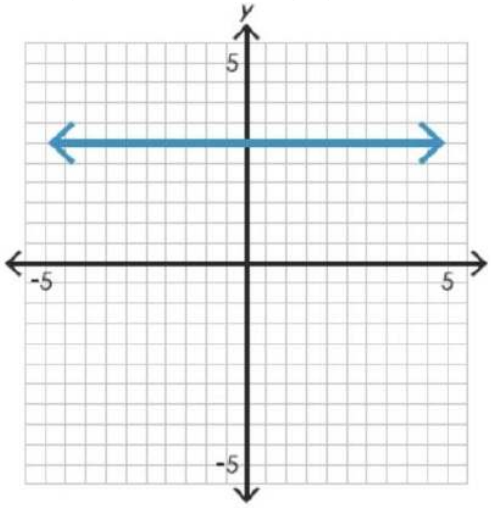
A. y = 2x + 70
B. y = 2x – 70
C. y = ½ x + 30
D. y = ½ x - 30

7. Which type of correlation is shown in the graph? What is the equation of the line of best fit?



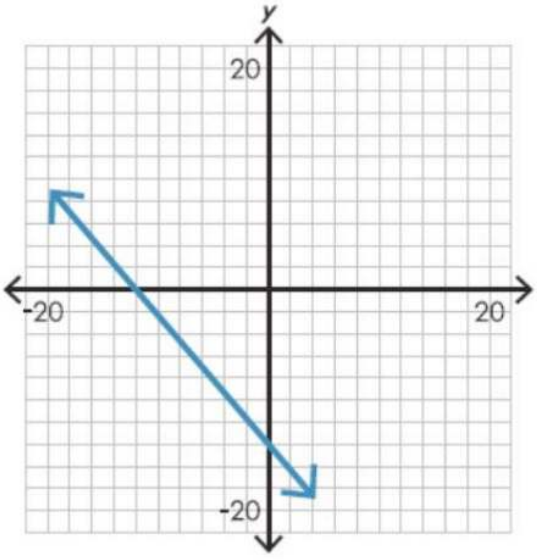
A. Negative non-linear correlation, cannot determine equation of line.
B. No correlation, cannot determine equation of line.
C. Negative linear correlation, y = -x + 70
D. Positive linear correlation. y = x —70

8. Which of the following is the equation of the line graphed below?



A. y = 3
B. y = 0
C. Undefined
D. y = x + 3

9. Which of the following is the equation of the line graphed below?



A. $y = x + 14$
B. $y = -x - 14$
C. $y = \frac{7}{6}x - 14$
D. $y = -\frac{7}{6}x - 14$

10. What is bivariate data?
    A. Data for 3 variables of unrelated data
    B. Data for 3 variables of related data
    C. Data for 2 variables of unrelated data
    D. Data for 2 variables of related data.

ANSWERS
Data, Statistics, and Probability - Advanced
Quiz 1

1. A We find the total students that do not want to join band (55) and divide by the total number of students (145) and get .379. We multiply by 100 to get the percentage which is 37.9%.
2. D The total monthly cost: c = .08m (minutes used) + 20 (monthly fee). C = .08m + 20
3. A In the equation y = .08x + 20, the y-intercept is 20 and the slope is .08.
4. C We find the number of athletes (those who play a sport) and find the percentage of those student who made the Honor roll. We get 75/104, which is 72%.
5. C The blue line represents the line of best fit. It is equidistant from the majority of the points and a standard deviation is more easily seen.
6. B We first find the slope by finding the change in y/change in x. The slope is 2. Then, we use y = 2x + b and substitute in one of the points shown on the graph. Substitute (50, 30) into the equation where 30 = 2(50) + b to solve for b. 30 = 100 + b, b=-70. The equation is y = 2x—70.
7. C The line of best fit would have a slope of -1 and would have a y-intercept at 70. The negative linear correlation would have an equation of the line of best fit of y = -x + 70.
8. A The equation of this horizontal line is y = 3. Regardless of what x is, y is always 3. (Note: the lines on the coordinate plane count by ½.)
9. B The slope (rise/run) is -1 and the y-intercept is -14. The equation is y = -x — 14.(Note: the lines on the coordinate plane count by 2's.)
10. D Bivariate data is data of 2 related variables.

Math Questions for the MAP Exam®
8th Grade
Functions - Basic
10 Questions
Quiz 1

Directions: Identify the choice that best completes the statement or answers the question.

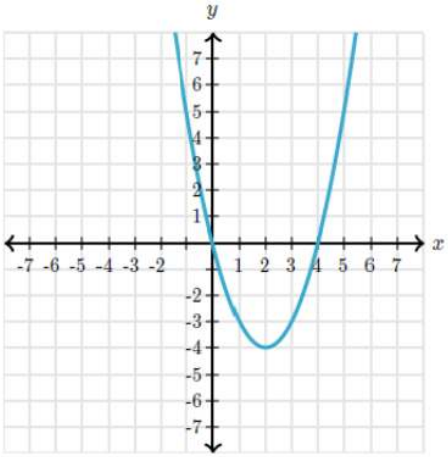
1. In the function table below, what is the value of R?

1	R	8	9

A. 8
B. 3
C. 4
D. -1

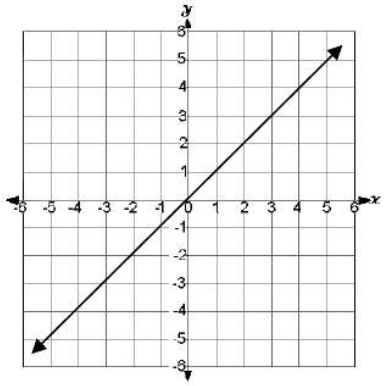
2. Which of the following functions has the greatest rate of change?
A. $f(x) = 2x - 3$
B. $f(x) = -4x + 2$
C. $f(x) = 5x + 1$
D. $f(x) = 6x$

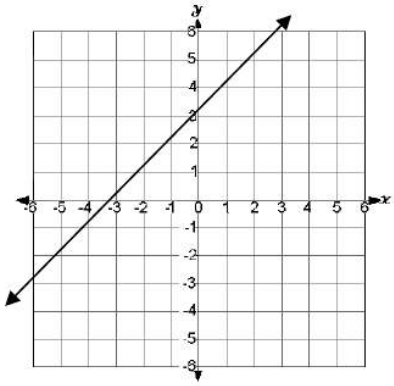
3. Does the following graph represent a function?

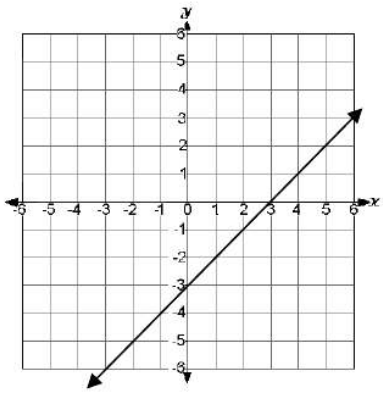


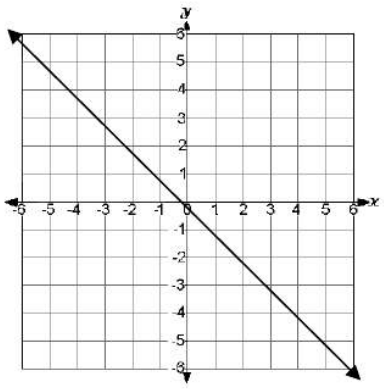
A. Yes
B. No
C. I need more information

4. Which of the following is the graph of -3x + 3y = 9?

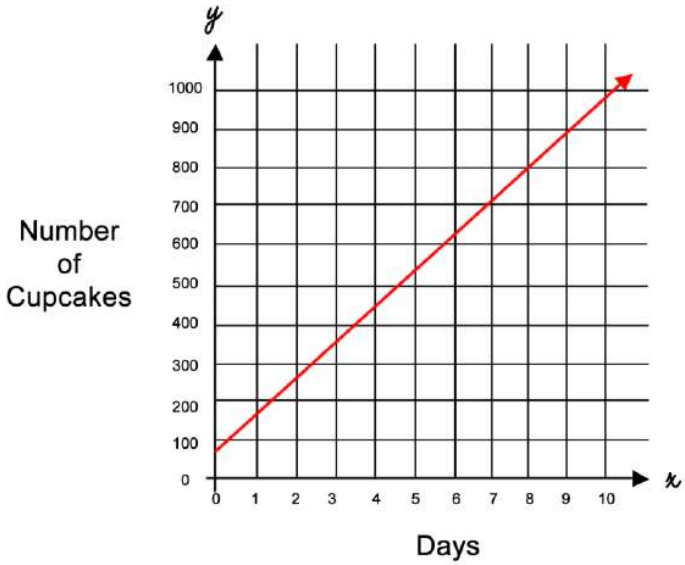
A. 

B. 

C. 

D. 

5. Louise owns a bakery. She graphed the number of cupcakes she bakes on the graph below.



How many cupcakes does Louise bake in 7 days?

A. 780 cupcakes

B. 800 cupcakes

C. 670 cupcakes

D. 700 cupcakes

6. Joey rolls a standard 6-sided die. What is the domain?

A. $0 \leq x \leq 6$

B. $1 \leq x \leq 6$

C. $0 \leq x \leq 12$

D. $1 \leq x \geq 6$

7. What is the y-intercept of $2x - 4y = 8$? What is the x-intercept?

A. The y-intercept is -2. The x-intercept is 4.

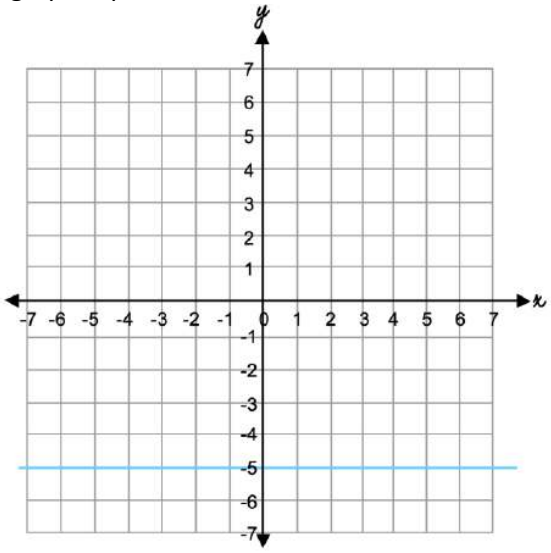
B. The y-intercept is $\frac{1}{2}$. The x-intercept is -4.

C. The y-intercept is 2. The x-intercept is $\frac{1}{4}$.

D. The y-intercept is $-\frac{1}{2}$. The x-intercept is 1.

8. Denver is a musician. He earned $20 for performing 4 songs. After a month, he started earning $25 for performing 5 songs. How much money does Denver earn per song?
   A. Denver earns $4.00 per song.
   B. Denver earns $5.00 per song.
   C. Denver earns different amounts per song.
   D. None of the above.

9. Does the following graph represent a function?



   A. Yes
   B. No
   C. I need more information

10. Is the function below linear?

x	1	2	3	4	5
y	5	10	15	20	25

   A. Yes, it is linear.
   B. No, it is not linear.
   C. I need more information.

ANSWERS
Functions - Basic
Quiz 1

1. B If we replace the x with -1 in the function f(x) = 2x + 5, the result is f(x) = 2(-1) + 5, f(x) = 3. Therefore R = 3.
2. D The coefficient of x (slope) is also known as the rate of change. Choice D has a rate of change of 6. It is the greatest of the choices.
3. A This graph represents a function. The vertical line test helps determine that it is a function.
4. B We solve for y and get y = x + 3. The slope is 1. The y-intercept is 3.
5. D We read the graph to find that at day 7, Louise had made 700 cupcakes.
6. B The domain is the set of numbers that *could* be an answer. In this case, we cannot roll a zero on a die, so the set is all numbers 1-6.
7. A We solve for y and get y = ½ x - 2. By substituting 0 in for x, we get y = -2, therefore the y-intercept is -2. We solve for x and get x = 2y + 4. By substituting 0 in for y, we get x = 4, therefore the x-intercept is 4.
8. B In both instances, Denver earns $5 per song.
9. A Yes, this represents a function. The vertical line test helps determine that it is a function.
10. A This function is linear. The rate of change is constant at f(x) = 5x.

Math Questions for the MAP Exam®
8th Grade
Functions - Proficient
10 Questions
Quiz 1

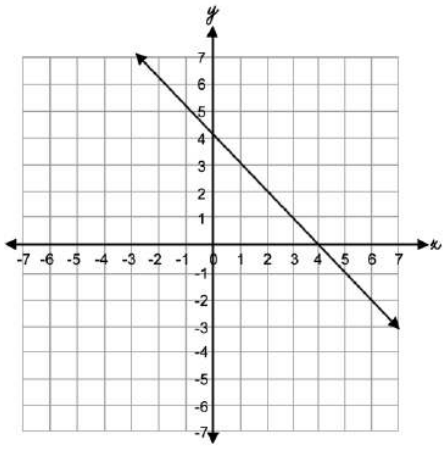
Directions: Identify the choice that best completes the statement or answers the question.

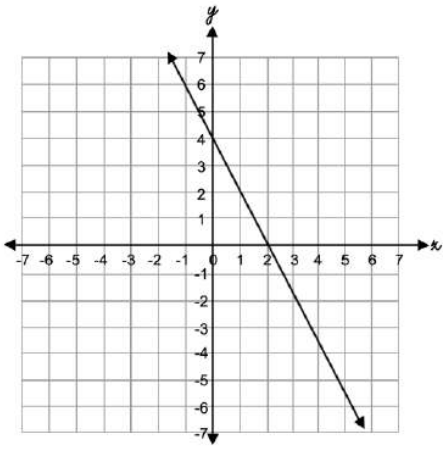
1. Which of the following lines is the graph of the function below?

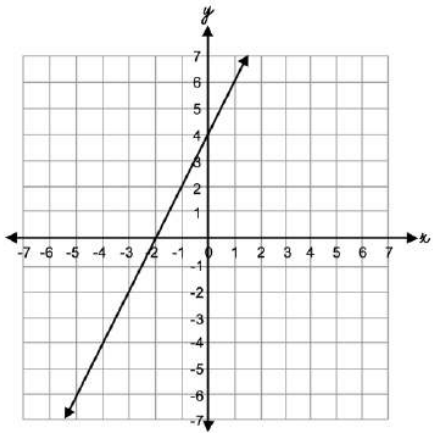
A. orange
B. purple
C. green
D. blue

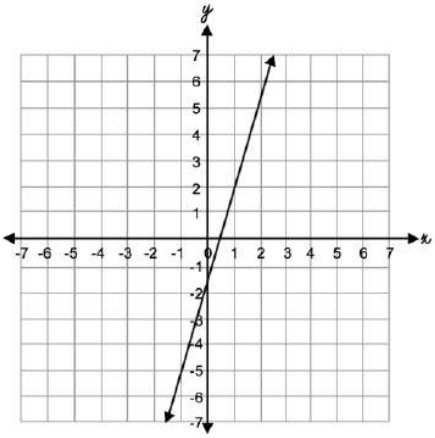
2. Which of the following has the greatest rate of change?
   A. $f(x) = -4x + 7$
   B. $f(x) = -x + 8$
   C. $f(x) = -5x - 4$
   D. $f(x) = -\frac{16}{3}x + 2$

3. Which of the following graphed lines represents 4x + 2y = 8?

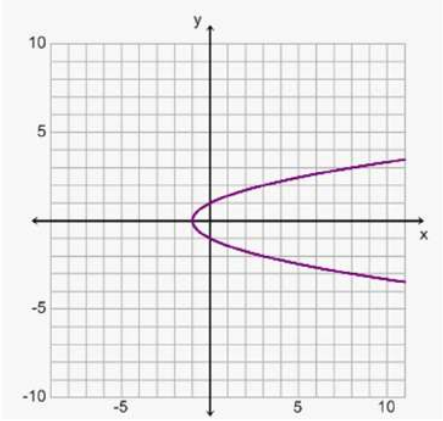
A. 

B. 

C. 

D. 

4. Does the following graph represent a function?



A. Yes
B. No
C. I need more information

5. What is the y-intercept of 6x – 3y = 3? What is the x-intercept?
A. The y-intercept is -1. The x-intercept is $\frac{1}{2}$.
B. The y-intercept is 1. The x-intercept is $-\frac{1}{2}$.
C. The y-intercept is 3. The x-intercept is 2.
D. The y-intercept is 6.The x-intercept is -2.

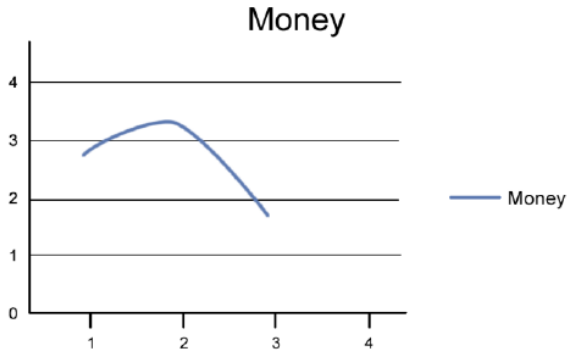
6. Julio has a bike shop. He sold 3 bikes in one day. If he continues at this rate, how many bikes will he sell in 5 days? What is the equation/rule of the function?
A. He sells 8 bikes in 5 days. f(x) = 8x.
B. He sells 15 bikes in 5 days. f(x) = 3y.
C. He sells 15 bikes in 5 days. f(x) = 3x.
D. He sells 10 bikes in 5 days. f(x) = 5x.

7. Is the graph of the function below linear, nonlinear, or neither?

x	1	2	3	4	5
y	4	10	8	9	7

A. Linear
B. Nonlinear
C. None of the above

8. Is the graph of the function below linear, nonlinear, or neither?



A. Linear
B. Nonlinear
C. None of the above

9. On Wednesday, Chris solves 6 math questions in one hour. If he continues at this rate, how many will he solve *completely* in 7 hours 15 minutes?
A. 42 math problems
B. 43 math problems
C. 43.5 math problems
D. 43.25 math problems

10. Which function below has the greatest rate of change?

A.

x	0	1	2	3
y	16	14	12	10

B.

x	0	1	2	3
y	12	15	18	21

C.

x	0	1	2	3
y	40	37	34	31

D.

x	0	1	2	3
y	10	15	20	25

ANSWERS
Functions - Proficient
Quiz 1

1. A The orange line passes through the points in the function table. Choice A.
2. D The greatest rate of change is -16/3. Choice D is correct.
3. B We solve the equation for y resulting in y = -2x + 4. The slope is -2 or -2/1 and the y-intercept is 4.
4. B This graph does not represent a function. Using the vertical line test, it intersects at more than one point, therefore it is NOT a function.
5. A We solve for y and get y = 2x -1. The y-intercept is -1. We solve for x and get x = ½. The x-intercept is ½.
6. C Three bikes per day means that f(x) = 3 times number of days = 3 times 5 = 15 bikes; f(x) = 3x.
7. B This function does not have a constant rate of change; therefore, it is nonlinear.
8. B This is the graph of a nonlinear function.
9. B 6 problems in 1 hour is 6 problems in 60 minutes or 1 problem every 10 minutes. In 7 hours, Chris can solve 6 x 7 = 42 problems. He has an extra 15 minutes to solve more problems, but he can only complete 1 in that 15 minute period, as it takes 10 minutes per problem. 42 + 1 = 43 complete problems. OR 7 hours 15 minutes = 435 minutes, 435/6 = 43.25 problems in 7 hours and 15 minutes, but the question asks how many they will completely solve. That makes the answer 43.
10. D Rate of change is: difference in the y values/difference in the x values. Choice D has a rate of change of 5/1 or 5. Five is the greatest rate of change. Rate of change for Choices A, B, and C are -2, 3, and -3.

Math Questions for the MAP Exam®
8th Grade
Functions - Advanced
10 Questions
Quiz 1

Directions: Identify the choice that best completes the statement or answers the question.

1. Which of the following is the equation that represents this functional relationship?

   A. $y = 2x$

   B. $y = -\frac{1}{2}x$

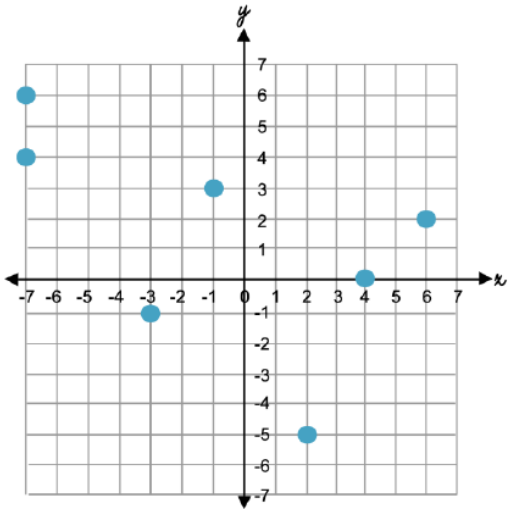
   C. $y = -2x$

   D. $y = \frac{1}{2}x - 1$

2. If y is a function of x, which of the following is NOT true?
   A. Every x value is associated with the same y value.
   B. Every y value is associated with the same x value.
   C. Two different x values are associated with one y value.
   D. A particular x value is associated with two different y values.

3. Which of the following has the least rate of change?
   A. $f(x) = x + 2$
   B. $f(x) = -\frac{3}{2}x - 1$
   C. $f(x) = 3x - 7$
   D. $f(x) = \frac{1}{3}x + 9$

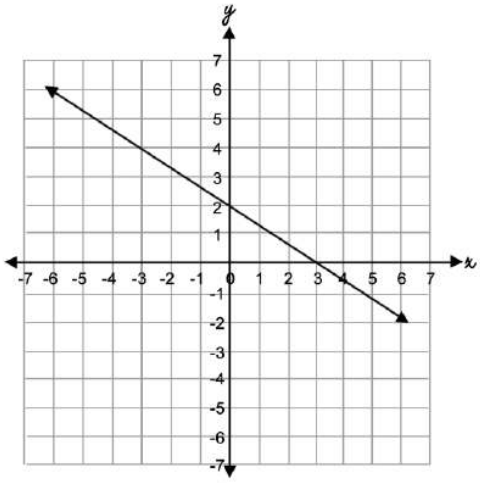
4. Does the graph below represent a function?

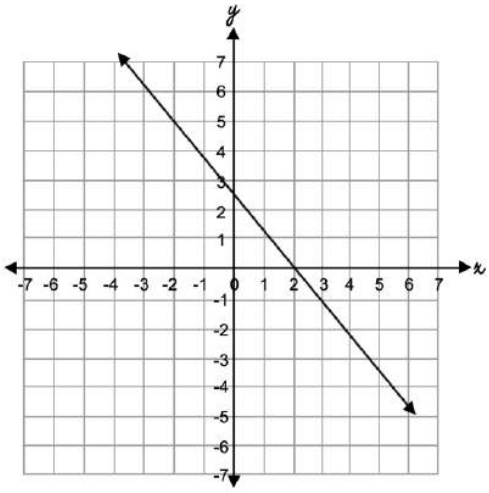


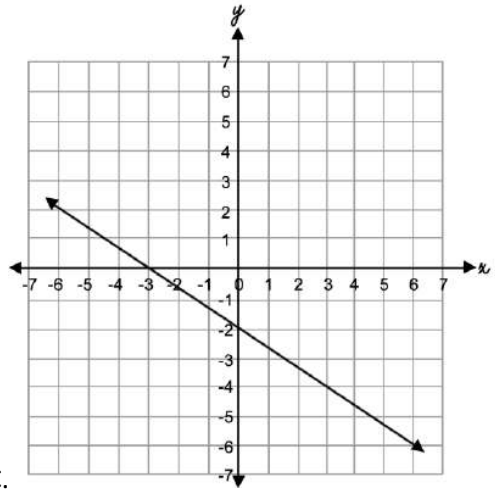
   A. Yes
   B. No
   C. I need more information

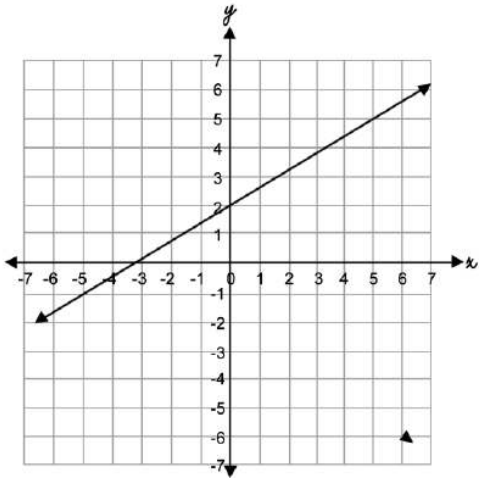
5. What is the y-intercept of y = -3x + 12? What is the x-intercept?
   A. The y-intercept is 3. The x-intercept is 3.
   B. The y-intercept is 12.The x-intercept is 4.
   C. The y-intercept is 4. The x-intercept is 0.
   D. The y-intercept is 12. The x-intercept is 1.

6. Which of the following is the graph of 2x + 3y = 6?

A. 

B. 

C. 

D. 

7. Constance brought 2 bottles of water per day during a trip. How many days will Constance have to spend on the trip before she will have brought a total of 12 bottles of water? What is the equation/rule of the function?
   A. 3 days; f(x) = 10x − 2
   B. 6 days; f(x) = 10x
   C. 6 days; f(12) = 2x − 2
   D. 6 days; f(12) = 2x

8. What is the slope of the line that passes through (-7, -7) and (3, -6)?
   A. The slope is 10.
   B. The slope is 5.
   C. The slope is $\frac{1}{10}$.
   D. The slope is $\frac{1}{5}$.

9. Which of the following is an equation for a line that is parallel to y = 2x + 3 in point-slope form?
   A. $y = 2x + \frac{1}{3}$
   B. $y = \frac{1}{2}x + 3$
   C. $y = 3x + 2$
   D. $y = \frac{1}{3}x + 2$

10. What is the y-intercept for the function below?

$$y = 2x - 4$$

x	y
2	
-2	
4	
3	
6	

   A. The y-intercept is -2.
   B. The y-intercept is -4.
   C. The y-intercept is 2.
   D. The y-intercept is 0.

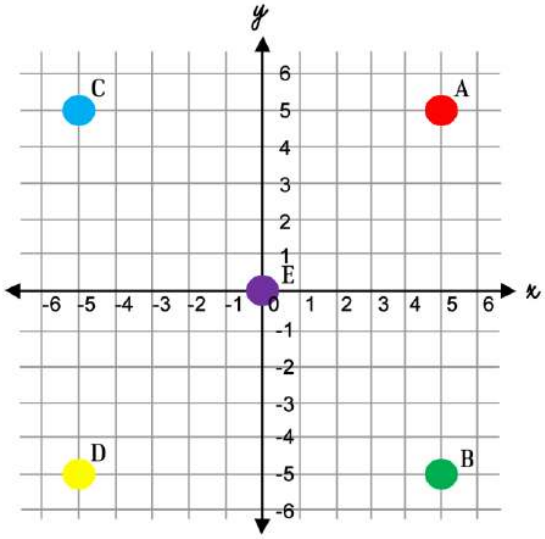
ANSWERS
Functions - Advanced
Quiz 1

1. C We find the function by determining the relationship or the slope of the line that accompanies this function. The slope is found by determining the change in y (-2) and dividing by the change in x (1). Therefore, the slope is -2. The point (0,0) tells me this function passes through the origin, so its y-intercept is zero. The equation is $y = -2x$.
2. D For each x, there can be only one value for y. However, it is possible to put in 2 different values for x and get the same value for y. (i.e. x = -2, y = 4 and x = 2, y = 4).
3. D 1/3 is the smallest rate of change. Rate of change is measured in absolute value.
4. B This graph does not represent a function because for one value of x, there are 2 different values for y.
5. B The y intercept is given in the equation (12). To find the x intercept, we make y = 0 and solve for x. x = 4.
6. A We use 2x + 3y = 6 and solve for y. This results in y = $-\frac{2}{3}x + 2$. The y-intercept is 2. The slope is $-\frac{2}{3}$.
7. D f(12) – "the function of 12" is equal to 2 x # of days.
8. C The change in y is 1 and the change in x is 10. The slope is $\frac{1}{10}$.
9. A A line is parallel if it has the same slope. The slope of y = 2x + 3 is 2; the slope of y = 2x + 1/3 is also 2. (y = mx + b, where m is the slope of the line.)
10. B The y-intercept is the value where x = zero. Substitute 0 into the equation/rule, and the result is y = -4. The y-intercept is -4.

Math Questions for the MAP Exam®
8th Grade
Geometry - Basic
10 Questions
Quiz 1

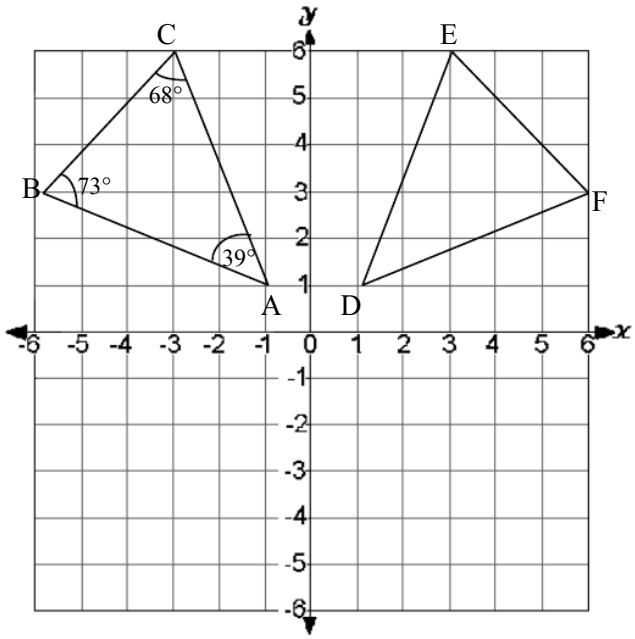
Directions: Identify the choice that best completes the statement or answers the question.

1. Which of the following points is the image of point D after a reflection over the y-axis?



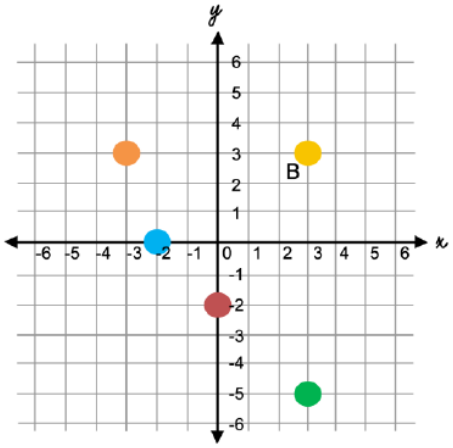
A. Point A
B. Point B
C. Point C
D. Point E

2. Δ ABC is reflected across the y-axis. What is the measure of ∠ E?



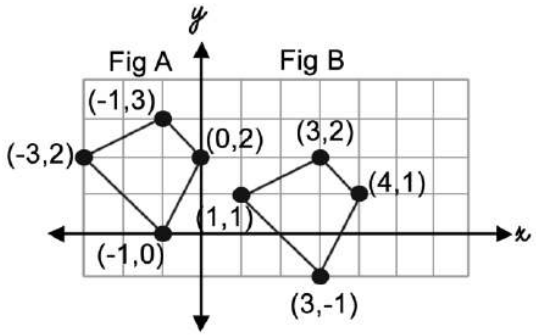
A. 73°
B. 68°
C. 39°
D. 107°

3. Which point is the image of point B after it is translated down 3 units and left 5 units?



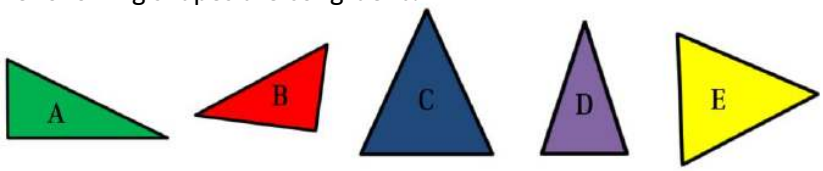
A. (-2, 0) blue
B. (0,-2) red
C. (3,-5) green
D. (-3,3) orange

4. What series of transformations occurred to map Figure A onto Figure B?



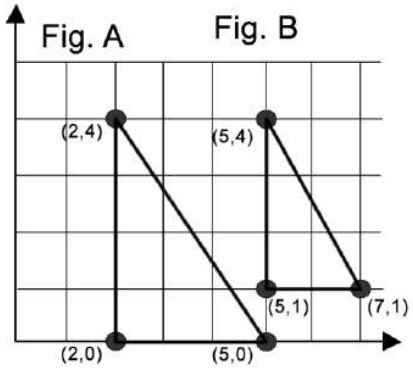
A. Reflection over the y-axis, translate down 2 units.
B. Rotation of 180° counterclockwise, translate down 1 unit.
C. Translate by (4,-1), meaning translate 4 units to the right and 1 unit down.
D. Rotation of 180° clockwise, translate down 1 unit.

5. Which of the following shapes are congruent?



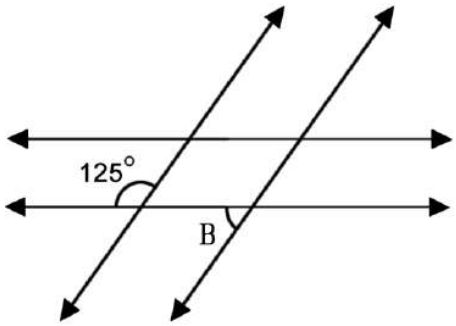
A. Shapes C and D are congruent.
B. Shapes A and B are congruent.
C. Shapes C and E are congruent.
D. Shapes D and E are congruent.

6. Is Figure A similar to Figure B?



A. Yes
B. No
C. I need more information to determine

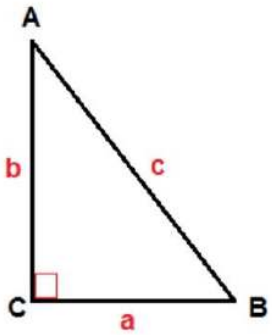
7. What is the measure of ∠B?



A. 125°
B. 55°
C. 25°
D. 75°

8. Paul needs to clean his gutters. He leans the ladder against the 8 ft tall wall of his house with the base of the ladder 5 feet away from the house. About how far must Paul climb to get to the roof? Round your answer to the nearest tenth. (You may use a scientific calculator.)
A. 8.7 feet
B. 9.0 feet
C. 9.4 feet
D. 7.4 feet

9. If a = 6 and b = 8, what does side c equal?



A. 10
B. 12
C. 11
D. 9

10. Television widths are measured diagonally. Mike wanted a new 80 inch TV. The store accidentally placed a sticker over the height of the TV. Mike knows the width is 70 inches. What is the height of the TV? Round your answer to the nearest tenth. (You may use a scientific calculator.)
    A. 10.4 inches
    B. 20.8 inches
    C. 34.2 inches
    D. 38.7 inches

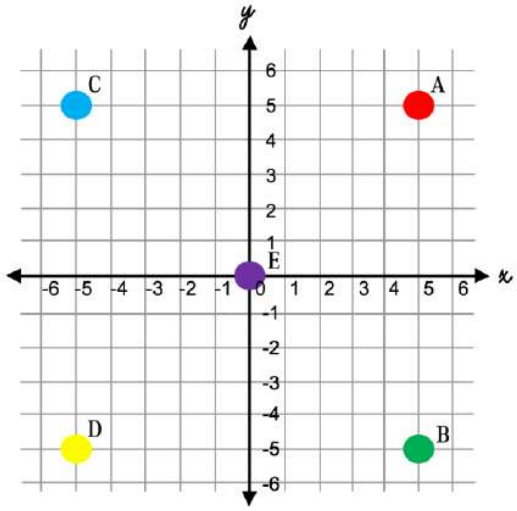
ANSWERS
Geometry - Basic
Quiz 1

1. B Point B is a reflection of Point D after a reflection over the y-axis.
2. B Angles map to angles. Angle E is 68°.
3. A Points translate to points. The blue point at (-2,0) is the translated image.
4. C Figure A is translated by (4,-1) four to the right (positive) and one down (negative).
5. C congruent = same shape, same size. Shapes C and E are congruent.
6. B Although they might appear to be similar, they do not have the same scale factor for each side.
7. B Adjacent angles tells me that the angle below 125° is 55°. The rule of corresponding angles tells me that Angle B is 55°.
8. C We use the Pythagorean Theorem to determine $8^2 + 5^2 = c^2$. $64 + 25 = c^2$. $c^2 = \sqrt{89}$. $\sqrt{81} = 9$ and $\sqrt{100} = 10$, $\sqrt{89} = 9.4\ (\text{rounded})$.
9. A $6^2 + 8^2 = c^2$. This equals $36 + 64 = c^2$. $100 = c^2$. $\sqrt{100} = c$. Therefore, c = 10.
10. D Use the Pythagorean Theorem to calculate the side length. $70^2 + b^2 = 80^2$. $4900 + b^2 = 6400$. Solving for b, we get b = $\sqrt{1500}$ which is 38.7.

Math Questions for the MAP Exam®
8th Grade
Geometry - Proficient
10 Questions
Quiz 1

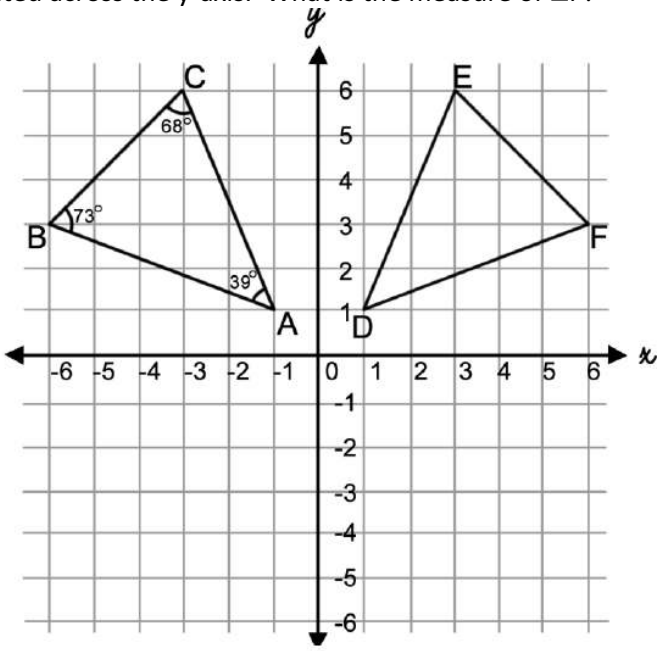
Directions: Identify the choice that best completes the statement or answers the question.

1. Which of the following is the new image of point D after a reflection over the x-axis?



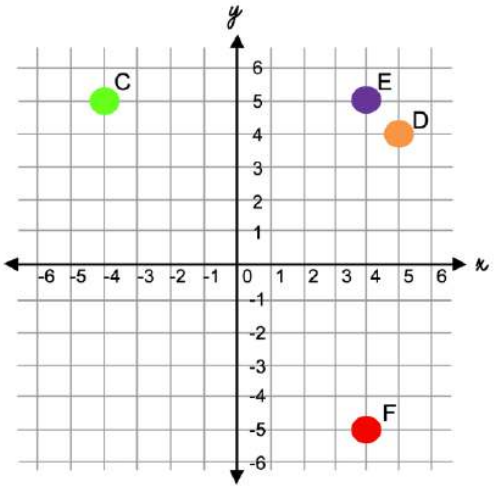
A. Point A
B. Point B
C. Point C
D. Point E

2. Δ ABC is reflected across the y-axis. What is the measure of ∠F?



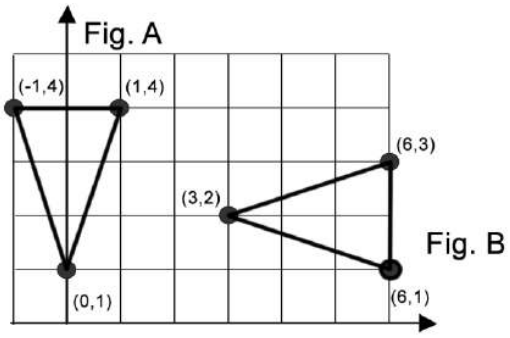
A. 68°
B. 73°
C. 39°
D. 112°

3. Which point is the image of point C after a 90° rotation clockwise around the origin?



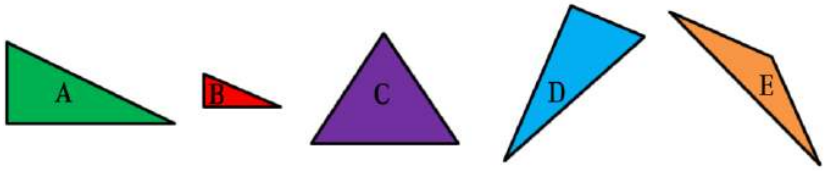
A. Point D
B. Point E
C. Point F
D. None of the above

4. What series of transformations occurred to map Figure A onto Figure B?



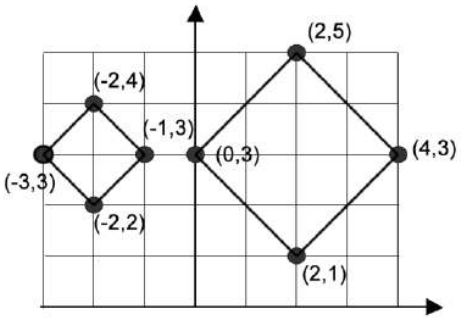
A. Translation of (1,5) Translate up one unit and right 5 units.
B. Reflection over the y-axis and translate 5 to the right.
C. Rotation 90° clockwise around the origin, then translate by (2,2) - right 2, up 2.
D. Rotation of 90° counterclockwise around the origin, then translate by (3,2) -right 3, up 2

5. Which of the following shapes are congruent?



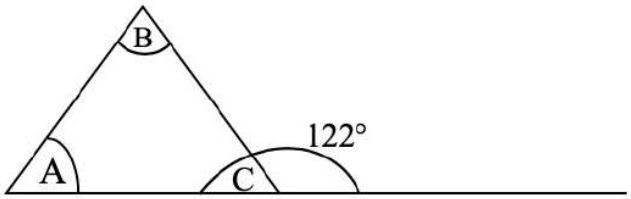
A. Shapes A and B are congruent.
B. Shapes C and D are congruent.
C. Shapes A and E are congruent.
D. Shapes D and A are congruent.

6. Is Figure A is similar to Figure B?



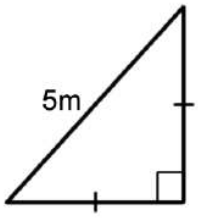
A. No, they are not similar.
B. Yes, they are similar.
C. I need more information to determine

7. Given that ∠A = ∠B, what are the angle measures of ∠A, ∠B, and ∠C?



A. Angle A is 61°, Angle B is 61°, Angle C is 58°.
B. Angle A is 65°, Angle B is 65°, Angle C is 50°.
C. Angle A is 50°, Angle B is 50°, Angle C is 80°.
D. Angle A is 58°, Angle B is 58°, Angle C is 64°.

8. What is the length of the other two sides? Round your answer to the nearest tenth. (You may use a scientific calculator.)



A. 3.5 m
B. 3 m
C. 3.75 m
D. 4.1 m

9. A 30 foot tall tree cast a shadow that is 40 feet long. What is the distance from the height of the tree to the end of the shadow? (You may use a scientific calculator.)
A. 70 meters
B. 50 meters
C. 60 feet
D. 50 feet

10. A round tube has a diameter of 8 in. and a height of 7 ft. What is the volume of the tube in cubic inches?

A. 1298π in^3
B. $1{,}504\pi$ in^3
C. $1{,}421\pi$ in^3
D. $1{,}344\pi$ in^3

ANSWERS
Geometry - Proficient
Quiz 1

1. C Point C is a reflection of Point D over the x-axis.
2. B The measure of angle F is 73° (angles map to angles)
3. A Point D (-4, 5) rotated by 90° clockwise around the origin maps to Point D (5, 4). When rotated clockwise, (x, y) → (y, -x). Therefore (-4, 5) →(5, 4).
4. C Figure A is first rotated clockwise by 90°. It is then translated by (2,2) meaning a translation of 2 to the right and 2 up.
5. D Shapes A and D are congruent. They are the same shape and same size.
6. B Figure A is similar to Figure B. They have the same scale factor.
7. A An exterior angle is equal to the sum of the opposite two interior angles. Angles A and B must equal 122°. They are equal to one another. Therefore 122/2 results in Angle A being 61° and Angle B being 61°. We subtract those from 180° to get that Angle C is 58°.
8. A Using the Pythagorean theorem we know that $a^2 + b^2 = c^2$. $a^2 + b^2 = 5^2$. Since a and b are equal, we can say $2a^2 = 25$. We divide by 2 to get $a^2 = 12.5$. $a = \sqrt{12.5}$ Each side = 3.5 m (rounded to the nearest tenths place)
9. D Use the Pythagorean theorem to find the distance from the top of the tree to the tip of the shadow. $30^2 + 40^2 = c^2$. 900 + 1600 = c^2. $C = \sqrt{2500}$. The distance is 50 feet.
10. D Volume of a cylinder = $\pi r^2 h$ or where πr^2 represents the area of the base. We first find the radius (1/2 of diameter) to find the area of the base, which is 16π. We then multiply that by the height in inches, which is 84 (the height in inches – 7 feet x 12 = 84inches.) Volume = $\pi \cdot 4^2 \cdot 84 = \pi \cdot 16 \cdot 84 = 1{,}344\pi$ in^3.

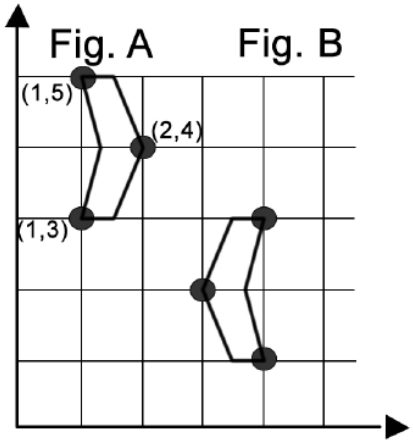
Math Questions for the MAP Exam®
8th Grade
Geometry - Advanced
10 Questions
Quiz 1

Directions: Identify the choice that best completes the statement or answers the question.

1. Which of these is the image of point D after the following series of transformations:
    1) Reflection over y-axis
    2) Reflection over x-axis

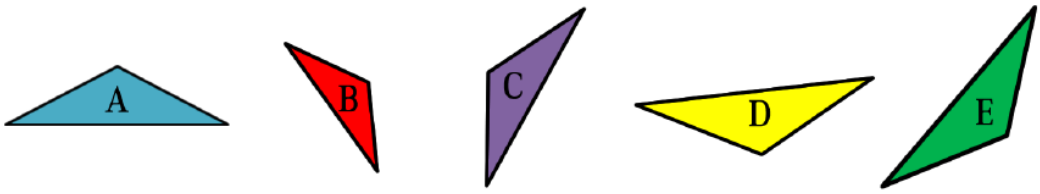
A. Point A
B. Point B
C. Point C
D. Point E

2. What series of transformations occurred to map Figure A onto Figure B?



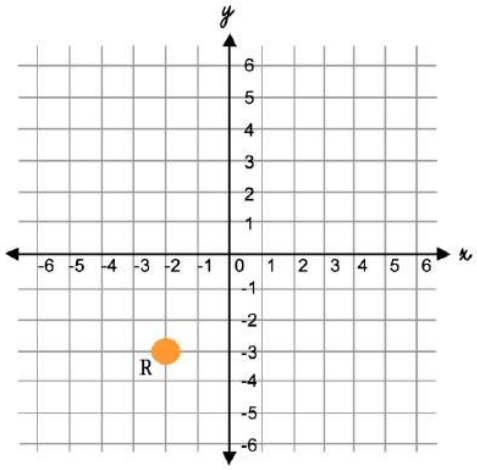
A. Reflection over an imaginary line at x= 2.5, followed by a translation of (0, -2)
B. Rotation of 180° counter clockwise, and a translation of (0,-2)
C. Reflection over a line at y = 3, and a translation of 2 units to the right
D. Rotation around the origin by 90° clockwise and a translation 2 units to the left.

3. Which of the following shapes is not congruent to the others?



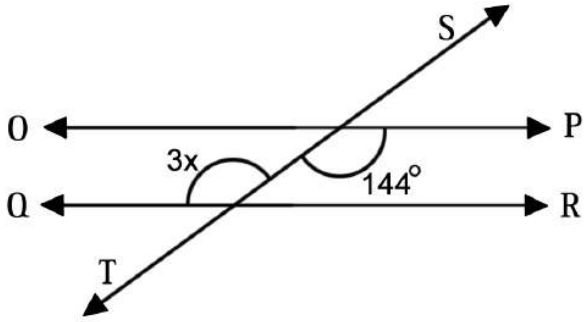
A. Shape E
B. Shape B
C. Shape D
D. Shape A

4. If the point R(-2,-3) were reflected over the x-axis and translated 2 units to the left, what is the resulting coordinate pair of the new point?



A. (3, -4)
B. (-3, 5)
C. (-2, 3)
D. (-4, 3)

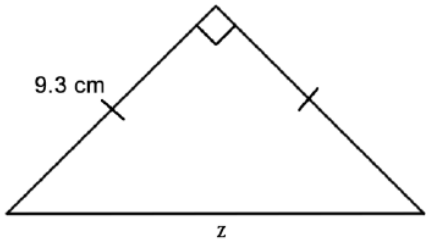
5. $\overline{OP} \parallel \overline{QR}$. $\overline{ST}$ is a transversal. What is the value of x?



A. 144°
B. 72°
C. 48°
D. 36°

6. Thomas leaves his house and drives due west from his house for 30 miles in a straight line. He then makes a 90° right hand turn and travels another 40 miles in a straight line. How far was he from his house?
   A. 70 miles
   B. 80 miles
   C. 60 miles
   D. 50 miles

7. What is the length of side z? Round to the nearest tenth. (You may use a scientific calculator.)



   A. 13 cm
   B. 13.2 cm
   C. 14 cm
   D. 14.5 cm

8. Tonya drew a right triangle with the two shorter leg lengths measuring 7.5 cm and 9 cm. What is the length of the hypotenuse of the triangle? Round to the nearest tenth. (You may use a scientific calculator.)
   A. 11.8 cm
   B. 12.2 cm
   C. 11.7 cm
   D. 11.1 cm

9. A basketball has a diameter of 24 cm. What is the volume of the contents of the basketball? Use the formula $V = \frac{4}{3}\pi r^3$ and write your answer in terms of π. (You may use a basic calculator.)
   A. 2,400π cm^3
   B. 2,304π cm^3
   C. 2,284π cm^3
   D. 2,114π cm^3

10. Anya bought party hats for her dogs. The opening for their head was 3 inches and the height is 5 inches. What is the volume of the party hats? Use the formula V = $\frac{1}{3}(\pi r^2)h$ and write you answer in terms of π. (You may use a basic calculator.)
    A. 3.75π
    B. 4.0π
    C. 3.5π
    D. 11.25π

ANSWERS
Geometry - Advanced
Quiz 1

1. A Point A is the image of point D after being reflected over the y-axis and then reflected over the x-axis.
2. A Figure A is a reflection over an imaginary line at x= 2.5, followed by a translation of (0, -2).
3. B Figure B is smaller than the others. It is similar, but not congruent.
4. D If point R is reflected over the x-axis and moved 2 places to the left, the resulting point is at (-4,3).
5. C Alternate interior angles are congruent. Therefore, 3x = 144 and we divide 144 by 3 to get x = 48°.
6. D The Pythagorean theorem tells us that $a^2 + b^2 = c^2$. Thomas drove the a and the b parts. Using the Pythagorean theorem, we get $30^2 + 40^2 = c^2$. $900 + 1600 = c^2$. $2500 = c^2$. $\sqrt{2500} = c$. $c = 50$. Thomas is 50 miles from home.
7. B Using the Pythagorean Theorem, we square 9.3. Using the hash marks on the Triangle, we know this is an isosceles triangle with 2 equal legs. $9.3^2 + 9.3^2 = z^2$ $z = 13.15$. We round to the nearest tenth to get 13.2 cm.
8. C Use the Pythagorean Theorem to find the hypotenuse $7.5^2 + 9^2 = c^2$. c = 11.7 cm.
9. B Use the formula $v = \frac{4}{3}\pi r^3$ to solve. $V = \frac{4}{3}\pi(12)^3 = \frac{4}{3}\pi(1728) = 4\pi(576) = 2{,}304\pi$ cm^3. 2,304π cm^3 is the volume of the basketball.
10. A Use the formula $V = \frac{1}{3}(\pi r^2)h$. We find the area of the base using the radius of 1.5. We find that the area of the base is 2.25. Multiply by the height of 5 to get 11.25π. Then divide by 3 to get 3.75π.

Math Questions for the MAP Exam®
8th Grade
The Number System - Basic
10 Questions
Quiz 1

Directions: Identify the choice that best completes the statement or answers the question.

1. Which of the following represents 0.6 as a fraction?

   A. $\frac{1}{6}$

   B. $\frac{6}{3}$

   C. $\frac{1}{3}$

   D. $\frac{2}{3}$

2. The fraction $\frac{15}{90}$ can be used to represent which of the following repeating decimal numbers?

   A. 0.61

   B. 0.6

   C. 0.16

   D. 1.16

3. Which simplified fraction is equivalent to $2.\overline{7}$?
   A. $\frac{25}{10}$
   B. $\frac{5}{2}$
   C. $\frac{25}{9}$
   D. $\frac{8}{3}$

4. What type of number is $\frac{\pi}{3}$?
   A. integer
   B. rational
   C. irrational
   D. whole

5. Without using a calculator, which statement best describes $\sqrt{18}$?
   A. The value of $\sqrt{18}$ is between 3.5 and 4.
   B. The value of $\sqrt{18}$ is between 4 and 4.5.
   C. The value of $\sqrt{18}$ is between 4.5 and 5.
   D. The value of $\sqrt{18}$ is between 5 and 5.5.

6. Which decimal is equivalent to $\frac{11}{55}$?
   A. 0.25
   B. $0.\overline{2}$
   C. 0.2
   D. $0.2\overline{5}$

7. What type of number is $14.\overline{157}$?
   A. rational
   B. whole
   C. irrational
   D. integer

8. Compare $3\frac{1}{3}$ ☐ $\sqrt{15}$

A. >

B. <

C. ≥

D. ≤

9. Without using a calculator, what belongs at point C?

A. $\sqrt{23}$

B. $\sqrt{29}$

C. $\sqrt{100}$

D. $\sqrt{32}$

10. Which choice below shows the following number in order from greatest to least?

$$\frac{\boldsymbol{\pi}}{\boldsymbol{\pi}} \qquad \pi \qquad \sqrt{\mathbf{14}}$$

A. $\frac{\pi}{\pi}, \pi, \sqrt{14}$

B. $\sqrt{14}, \frac{\pi}{\pi}, \pi$

C. $\pi, \sqrt{14}, \frac{\pi}{\pi}$

D. $\sqrt{14}, \pi, \frac{\pi}{\pi}$

ANSWERS
The Number System - Basic
Quiz 1

1. D If we divide 2 by 3, we get $0.\overline{6}$. Therefore, the fraction $\frac{2}{3}$ represents $0.\overline{6}$.
2. C $\frac{15}{90}$ can be represented as $0.1\overline{6}$. We set it up as follows:
   Divide 15 by 90 and get 0.166666666 which is $0.1\overline{6}$.
3. C We set x = $2.\overline{7}$. We then create the equivalent equation of 10x = $27.\overline{7}$. We find the difference: 10x - 1x = $27.\overline{7} - 2.\overline{7}$. This results in 9x = 25. X = $\frac{25}{9}$.
4. C Pi is always irrational as it is a non-repeating, non-terminating number. Unless pi were divided by pi, it will be irrational.
5. B The value of $\sqrt{18}$ is between 4 and 5, but we need to be more specific. Using a number line, we can see that the value of $\sqrt{18}$ is closer to $\sqrt{16}$ than it is to $\sqrt{25}$ so the value is between 4 and 4.5.
6. C 11/55 reduces to 1/5 which is the equivalent of 2/10 or 0.2.
7. A This number is a rational number. It is a "part of a number" and it does repeat, which makes it rational.
8. B Estimating the $\sqrt{15}$ means it is between 3 and 4 but very close to 4 or $\sqrt{16}$. Therefore $3\frac{1}{3}$ is less than $\sqrt{15}$.
9. A $\sqrt{23}$ is between 4 and 5 but is very close to 5. Point C represents this.
10. D $\frac{\pi}{\pi}$ = 1 (the least), pi is 3.14, and $\sqrt{14}$ is close to $\sqrt{16}$ or 4. The order from greatest to least is $\sqrt{14}$, π, $\frac{\pi}{\pi}$.

Math Questions for the MAP Exam®
8th Grade
The Number System - Basic
10 Questions
Quiz 2

Directions: Identify the choice that best completes the statement or answers the question.

1. Without using a calculator, which of the following is the closest approximation of $\sqrt{17}$?
   A. 4
   B. 4.50
   C. 4.25
   D. 4.12

2. What kind of number is π?
   A. whole number
   B. integer
   C. irrational number
   D. rational number

3. Which of the following is $6.\overline{4}$ as a simplified fraction?
   A. $\frac{64}{10}$
   B. $\frac{58}{9}$
   C. $\frac{32}{5}$
   D. $6\frac{2}{5}$

4. Which of the following is $4.3\overline{1}$ as a simplified fraction?
   A. $\frac{194}{45}$
   B. $\frac{388}{90}$
   C. $\frac{431}{100}$
   D. $4\frac{31}{100}$

5. Which of the following is an irrational number?
   A. $\frac{\pi}{6}$
   B. $\frac{1}{9}$
   C. 1.52257
   D. $\frac{\pi}{3\pi}$

6. Use the number line below to determine which of the following best represents point *O*?

   A. $\frac{243}{27}$
   B. $\sqrt{61}$
   C. $\sqrt{72}$
   D. 2π

7. Which of the choices below is the decimal equivalent to $\frac{4}{11}$?
   A. $0.3\overline{6}$
   B. 0.3
   C. $0.\overline{36}$
   D. $0.\overline{3}$

8. Which of the following represents $2.0\overline{71}$ as a simplified fraction?
   A. $\frac{2071}{1000}$
   B. $2\frac{71}{1000}$
   C. $\frac{207}{100}$
   D. $\frac{2051}{990}$

9. Which of the following choices is the decimal equivalent to $\frac{1}{8}$?
   A. $0.1\overline{2}$
   B. $0.1\overline{1}$
   C. 0.12
   D. None of the above

10. If you put these numbers in order on a number line, which number would be furthest from zero?

$$2.5\pi \qquad \frac{52}{6} \qquad 8\frac{2}{6} \qquad \sqrt{63}$$

   A. $\frac{52}{6}$
   B. 2.5π
   C. $\sqrt{63}$
   D. $8\frac{2}{6}$

ANSWERS
The Number System - Basic
Quiz 2

1. D Without using a calculator, students should narrow down their answer choices by using number sense and multiplication. The closest approximate to $\sqrt{17}$ is 4.12.
2. C π is an irrational number as it is non-repeating and non-terminating. It cannot be written as a fraction.
3. B Using x = $6.\overline{4}$ we generate the equivalent equation of 10x = $64.\overline{4}$. We find the difference of the two equations 10 x – 1 x =$64.\overline{4}$ - $6.\overline{4}$ and get 9x = 58. Dividing by 9, we get $\frac{58}{9}$.
4. A We set x = $4.3\overline{1}$, 10x= $43.\overline{1}$, and 100x = $431.\overline{1}$. We only use the former 2 equations to solve. Find the difference. We get 90x = 388. $\frac{388}{90} = \frac{194}{45}$.
5. A Fractions and decimals are rational provided that they are terminating and/or repeating. For choice D, the π's cancel out and leave $\frac{1}{3}$, which is rational. Choices A does not terminate since π goes on forever and does not divide or reduce by 6, therefore π/6 is irrational.
6. C $\sqrt{72}$ is the closest approximation for point *O*. This falls between 8 or $\sqrt{64}$ and 9 or $\sqrt{81}$.
7. C $0.\overline{36}$ is equivalent to $\frac{4}{11}$. This can be found by dividing 4 by 11.
8. D We set x = $2.0\overline{71}$, 10x = $20.\overline{71}$, 1000x = $2071.\overline{71}$. We find the difference in the latter two equations and get 990x = 2051. $\frac{2051}{990}$ is the correct response.
9. D The decimal equivalent to $\frac{1}{8}$ is 0.125. The correct answer is none of the above.
10. A $\frac{52}{6}$ = $8.\overline{6}$ and is the largest number. It is furthest from zero.

Math Questions for the MAP Exam®
8th Grade
The Number System - Proficient
10 Questions
Quiz 1

Directions: Identify the choice that best completes the statement or answers the question.

1. The number $\frac{36}{4}$ can be classified as all of the following with the exception of one. Which one can it not be?
   A. Integer
   B. Rational Number
   C. Whole Number
   D. Irrational Number

2. Which of the following is the simplified fraction of $0.\overline{6}$?
   A. $\frac{6}{10}$
   B. $\frac{2}{3}$
   C. $\frac{3}{5}$
   D. $\frac{6}{9}$

3. Which of the following is $3.\overline{7}$ as a simplified fraction?
   A. $\frac{34}{9}$
   B. $3\frac{7}{10}$
   C. 4
   D. None of the above

4. Without using a calculator, what is the approximate value of $\sqrt{51}$?
   A. The value is between 6.5 and 7.
   B. The value is between 7 and 7.5.
   C. The value is between 7.5 and 8.
   D. None of the above

5. If the values below were placed on a number line, which value will be third?
   A. 2π
   B. $\frac{51}{9}$
   C. $\sqrt{49}$
   D. $\frac{6.5\pi}{\pi}$

6. Which of the following decimals is equivalent to $\frac{47}{90}$?
   A. 0.53
   B. 0.52
   C. $0.5\overline{2}$
   D. 0.5

7. What is the approximate value of $\sqrt{99}$?
   A. The value is between 9.0 and 9.5.
   B. The value is between 9.5 and. 10.0.
   C. The value is between 10.0 and 10.5.
   D. None of the above.

8. What type of number is 0.303003012437…?
   A. Whole number
   B. Rational number
   C. Irrational number
   D. Integer

9. Which of the following is $0.8\overline{95}$ as a simplified fraction?
   A. $\frac{179}{200}$
   B. $\frac{895}{1000}$
   C. $\frac{887}{990}$
   D. $\frac{895}{990}$

10. Without using a calculator, what is the approximate value of $\sqrt{82}$?
   A. The value is between 9 and 9.05.
   B. The value is between 9.05 and 9.10.
   C. The value is between 9.10 and 9.15.
   D. The value is between 9.15 and 9.2.

ANSWERS
The Number System - Proficient
Quiz 1

1. D $\frac{36}{4}$ reduces to 9. Nine is a whole number, an integer, and a rational number. $\frac{36}{4}$ cannot be classified as an irrational number because it is a fraction. An irrational number is a number that cannot be written as a fraction.
2. B $0.\bar{6}$ is $\frac{6}{9}$ which then reduced to $\frac{2}{3}$. This is done by setting x = $0.\bar{6}$. We then create the equivalent equation of 10x = $6.\bar{6}$. We find the difference of the two equations. 10x - x = $6.\bar{6} - 0.\bar{6}$. This results in 9x = 6, therefore x = $\frac{6}{9}$ which reduces to $\frac{2}{3}$.
3. A We set x= $3.\bar{7}$ and 10x = $37.\bar{7}$. The difference between these two Equations is 9x = 34. The answer is A, $\frac{34}{9}$.
4. B We know the value of $\sqrt{51}$ is greater than $\sqrt{49}$ which is 7. We know the value is less than $\sqrt{64}$ which is 8. We can use a number line to narrow down our answer to determine that $\sqrt{51}$ is closer to $\sqrt{49}$, therefore, the value is between 7 and 7.5.
5. D $\frac{51}{9} = 5\frac{2}{3}$. 2π is about 6.28. $\sqrt{49}$ = 7. $\frac{6.5\pi}{\pi} = 6.5$. When placed on a number line, $\frac{6.5\pi}{\pi}$ is the third value.
6. C $\frac{47}{90}$ has the decimal equivalent of $0.5\bar{2}$. This can be determined by dividing 47 by 90.
7. B $\sqrt{99}$ is very close to $\sqrt{100}$ which equals 10. Therefore, we can deduce that $\sqrt{99}$ is between 9.5 and 10 since it is so close to $\sqrt{100}$ on a number line.
8. C This is a non-repeating, non-terminating decimal. It is irrational.
9. C We set x = $0.8\overline{95}$ and create the equivalent equation of 10x = $8.\overline{95}$ and 1000x = $895.\overline{95}$. The goal is to eliminate the repeating part of the decimal. We subtract 10x from 1000x and $8.\overline{95}$ from $895.\overline{95}$ to get 990x = 887. x = $\frac{887}{990}$ and cannot be simplified any further.
10. B $\sqrt{82}$ is greater than 9 or $\sqrt{81}$. The value is less than 10 or $\sqrt{100}$. The value is also closer to $\sqrt{81}$ than it is to $\sqrt{100}$ so I can narrow down my choices to 9.0 - 9.5. I choose decimals between those values and square them to further narrow down my estimate. The value is between 9.05 and 9.10. When squared it is between 81.9025 and 82.81.

Math Questions for the MAP Exam®
8th Grade
The Number System - Proficient
10 Questions
Quiz 2

Directions: Identify the choice that best completes the statement or answers the question.

1. Without use of a calculator, order the following numbers from greatest to least. Which number is the second number?

   $\sqrt{127}$ $9.\overline{7}$ $2\sqrt{68}$ $\frac{163}{15}$

   A. $9.\overline{7}$

   B. $\sqrt{127}$

   C. $\frac{163}{15}$

   D. $2\sqrt{68}$

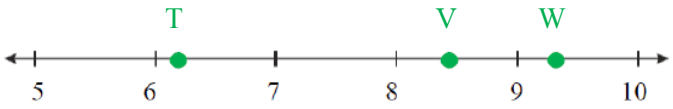
2. Which of the choices below is the closest approximation of $3\sqrt{42}$?
   A. 19.5
   B. 3.42
   C. 17.5
   D. 21.5

3. Which of the choices below is the closest approximation of $2\pi \div \sqrt{76}$? (You may use a scientific calculator.)
   A. .38
   B. .82
   C. 0.72
   D. 0.76

4. The number $\frac{36\pi}{3\pi}$ can be classified as all of the following with the exception of one. Which one can it not be?
   A. Whole
   B. Natural
   C. Irrational
   D. Rational

5. Which of the following is $7.\overline{94}$ as a simplified fraction?
   A. $\frac{787}{99}$
   B. $\frac{3}{5}$
   C. $\frac{72}{90}$
   D. $\frac{4}{5}$

6. Use the number line below to determine which of the following is the best representation of point *T*.



   A. $\sqrt{85}$
   B. $\sqrt{69}$
   C. $6.5\overline{7}$
   D. 2π

7. Which of the choices below is the decimal equivalent to $\frac{4}{9}$?
   A. 0.4
   B. $0.\overline{4}$
   C. $0.4\overline{4}$
   D. $0.\overline{44}$

8. Which of the following represents $9.0\overline{42}$ as a simplified improper fraction?
   A. $\frac{1494}{165}$
   B. $9\frac{21}{500}$
   C. $9\frac{42}{1000}$
   D. $\frac{1492}{165}$

9. What is the closest approximation of $2\pi/12\pi$?
   A. $\frac{1}{6}$
   B. 6
   C. $\frac{\pi}{6}$
   D. None of the above

10. If you put these numbers in order on a number line, which number has the lowest absolute value?
   A. $\frac{3}{4}$
   B. -4π
   C. $-\frac{\pi}{2\pi}$
   D. $\frac{8}{2.5}\pi$

ANSWERS
The Number System - Proficient
Quiz 2

1. B $2\sqrt{68} \approx$ 2 x 8 or close to 16, $\sqrt{127}$ is bit over $\sqrt{121}$ = 11, $\frac{163}{15} = 10.8\overline{6}$, and $9.\overline{7}$. In order from greatest to least: $2\sqrt{68}$, $\sqrt{127}$, $\frac{163}{15}$, $9.\overline{7}$. $\sqrt{127}$ is the second number in the sequence.
2. A $3\sqrt{42}$ where $\sqrt{42}$ is between $\sqrt{36}$ and $\sqrt{49}$ or 6 and 7. We can guess that $\sqrt{42}$ is in the middle at 6.5. 3 x 6.5 = 19.5 so $3\sqrt{42} \approx$ 19.5.
3. C $2\pi \approx 6.28$. $\sqrt{76} \approx 8.72$. $\frac{6.28}{8.72} \approx 0.72$. Choice C is correct.
4. C This reduces to $\frac{36}{3} = 12$. 12 is a natural, whole, and rational number. It is NOT an irrational number.
5. A x = $7.\overline{94}$, therefore 100x = $794.\overline{94}$. Find the difference 100x − 1x = $794.\overline{94} - 7.\overline{94}$. 99x = 787. $\frac{787}{99}$ is correct.
6. D 2π is the closest approximation of point T. 2 x 3.14 = 6.28
7. B $\frac{4}{9} = 0.\overline{4}$. 4 ÷ 9 = .444444… Choice B is correct because the notation is correct.
8. D Only choices A and D are options since they are the only choices that are improper fractions. When 1492 is divided by 165, the answer is $9.04242424242\ldots$. or $9.0\overline{42}$. $\frac{1492}{165}$ is the simplified improper fraction of $9.0\overline{42}$.
9. A The π's cancel out leaving $\frac{2}{12}$. $\frac{1}{6}$ is correct.
10. C $-\frac{\pi}{2\pi} = -\frac{1}{2}$ which has an absolute value of $\frac{1}{2}$ or 0.5, which is the smallest.

Math Questions for the MAP Exam®
8th Grade
The Number System - Advanced
10 Questions
Quiz 1

Directions: Identify the choice that best completes the statement or answers the question.

1. Which of the following is the simplified fraction of $3.3\overline{2}$?
   A. $\frac{332}{100}$
   B. $\frac{84}{25}$
   C. $\frac{299}{90}$
   D. $\frac{10}{3}$

2. What kind of number is 6.41?
   A. Whole number
   B. Rational number
   C. Irrational number
   D. Natural number

3. Which of the following is the approximate value of $\sqrt{8}$?
   A. The value is between 1.5 and 2.0.
   B. The value is between 2.0 and 2.5.
   C. The value is between 2.5 and 3.0.
   D. The value is between 3.0 and 3.5.

4. Compare the following numbers.

$$4\frac{1}{6} \quad \bigcirc \quad \sqrt{15}$$

A. >

B. <

C. ≥

D. ≤

5. What kind of number is 12.24591100267…..?
   A. Whole number
   B. Rational number
   C. Irrational number
   D. Integer

6. Which of the following is the approximate value of $3\sqrt{15}$?
   A. The value is between 11 and 11.5.
   B. The value is between 11.5 and 12.
   C. The value is between 12 and 12.5.
   D. None of the above

7. Order the following numbers from least to greatest

$$2\frac{2}{3} \qquad \sqrt{9} \qquad \sqrt[3]{1}$$

A. $2\frac{2}{3}, \sqrt{9}, \sqrt[3]{1},$

B. $\sqrt[3]{1}, \sqrt{9}, 2\frac{2}{3}$

C. $\sqrt[3]{1}, 2\frac{2}{3}, \sqrt{9}$

D. $\sqrt{9}, \sqrt[3]{1}, 2\frac{2}{3}$

8. The number $\frac{\pi}{\pi}$ can be classified as all of the following but one. Which one can it not be?
   A. Whole number
   B. Rational number
   C. Irrational number
   D. Natural number

9. What is the value of $\sqrt[3]{64}$?
   A. 8
   B. 4
   C. 16
   D. 2

10. What kind of number is $\frac{72}{0}$?
   A. Whole number
   B. Rational number
   C. Undefined number
   D. Imaginary number

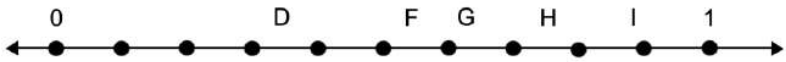
ANSWERS
Number System - Advanced
Quiz 1

1. C If x = 3.3$\overline{2}$ and 10x = 33.$\overline{2}$ and 100x = 332.$\overline{2}$, then we find the difference Between 100x - 10x = 332.$\overline{2}$ - 33.$\overline{2}$ to eliminate the repeating part of the decimal. We get 90x = 299. Therefore 299/90 (which is simplified) is correct.
2. B This is a rational number because it repeats.
3. C The value is between 2.5 and 3.0. We know that $\sqrt{9}$ = 3 and $\sqrt{8}$ is close to $\sqrt{9}$.
4. A $\sqrt{15}$ is less than 4, therefore it is less than $4\frac{1}{6}$.
5. C This is irrational because it is non-repeating and non-terminating.
6. B $\sqrt{15}$ is approximately 3.9. Since it is multiplied by 3 (about 11.7) then the value is between 11.5 and 12.
7. C The order for least to greatest is: $\sqrt[3]{1} = 1$, $2\frac{2}{3} = 2.\overline{6}$, $\sqrt{9}$ = 3.
8. C $\frac{\pi}{\pi}$ reduces to 1. One is a natural number, a whole number and a rational number. 1 is NOT an irrational number.
9. B The cube root of 64 is 4. (4 x 4 x 4 = 64)
10. C Any number divided by zero is an undefined number.

Math Questions for the MAP Exam®
8th Grade
The Number System - Advanced
10 Questions
Quiz 2

Directions: Identify the choice that best completes the statement or answers the question.

1. Which point on the number line is the best representation of $0.78\overline{4}$?



   A. B
   B. A
   C. D
   D. H

2. Which of the following accurately describes the square root of 8?
   A. Whole
   B. Rational
   C. Natural
   D. Irrational

3. Which of the following is an example of a finite decimal?
   A. $1.\overline{4}$
   B. 0.8125
   C. $0.04\overline{7}$
   D. $\sqrt{25}$

4. Which of the following statements is true?
   A. Every whole number is a rational number.
   B. Every rational number is a natural number.
   C. Every rational number is a whole number.
   D. Every natural number is a rational number.

5. Which number below is not an integer?
   A. $-\frac{10}{5}$
   B. $\sqrt{16}$
   C. $\frac{23}{2}$
   D. $-\sqrt{256}$

6. Which of the following demonstrates the correct order from least to greatest of these real number terms?
   A. $\sqrt{49}$. 0.49, $\frac{1}{2}$, 7.5
   B. 0.49, $\frac{1}{2}$, $\sqrt{49}$, 7.5
   C. 7.5, $\sqrt{49}$, $\frac{1}{2}$, 0.49
   D. $\frac{1}{2}$, 0.49, $\sqrt{49}$, 7.5

7. Which is the best description of where $\sqrt{21}$ falls on a number line?
   A. $\sqrt{21}$ falls between 4.5 and 5.0 on a number line.
   B. $\sqrt{21}$ falls between 4.0 and 4.5 on a number line.
   C. $\sqrt{21}$ falls between 5.5 and 6.0 on a number line.
   D. $\sqrt{21}$ falls between 5.0 and 5.5 on a number line

8. Between which 2 integers does -2 $\sqrt{5}$ fall on a number line? (You may use a scientific calculator.)

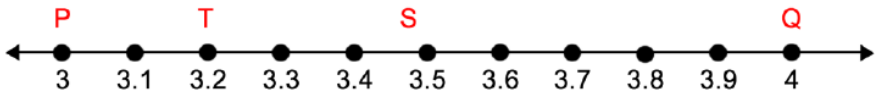
   A. -2 $\sqrt{5}$ falls between -4.0 and -4.25.

   B. -2 $\sqrt{5}$ falls between 4.5 and 4.75.

   C. -2 $\sqrt{5}$ falls between -4.25 and -4.50.

   D. -2 $\sqrt{5}$ falls between-4.75 and -5.0.

9. Which of the following choices represents the letters from greatest to least?



   A. $\sqrt{16}, \sqrt{12}, \frac{29}{9}, \sqrt[3]{27}$

   B. $\sqrt{12}, \frac{29}{9}, \sqrt{16}, \sqrt[3]{27}$

   C. $\frac{29}{9}, \sqrt{16}, \sqrt[3]{27}, \sqrt{12}$

   D. $\sqrt{12}, \sqrt[3]{27}, \sqrt{16}, \frac{29}{9}$

10. Which inequality below is true?

   A. $\frac{7}{12} < 0.58\overline{3}$

   B. $0.583 > \frac{7}{12}$

   C. $0.583 \geq \frac{7}{12}$

   D. $\frac{7}{12} \geq 0.58\overline{3}$

ANSWERS
The Number System - Advanced
Quiz 2

1. D Point H is the closest representation of $0.78\overline{4}$. It is between 0.7 and 0.8 on the number line.
2. D $\sqrt{8}$ cannot be expressed as the ratio of two integers, nor as a repeating decimal number. Therefore, it is irrational.
3. B 0.8125 is the only finite decimal.
4. D Natural numbers are included in rational numbers.
5. C $\frac{23}{2}$ is not an integer. It is equal to $11\frac{1}{2}$. It is a rational number.
6. B The correct order is 0.49, $\frac{1}{2}$, $\sqrt{49}$, 7.5. (0.49, 0.5, 7.0, 7.5)
7. A The $\sqrt{21}$ = about 4.58, therefore it falls between 4.5 and 5.0 on the number line. $\sqrt{21}$ is close to $\sqrt{25}$ which equals 5.
8. C -2 $\sqrt{5} \approx -4.47$ and falls between -4.25 and -4.50 on a number line.
9. A $\sqrt{16}$, $\sqrt{12}$, $\frac{29}{9}$, $\sqrt[3]{27}$ is the correct order from greatest to least.
10. D Choice D is the only correct answer.

Math Questions for the MAP Exam®
8th Grade
Mathematics - Basic
51 Questions
Test 1

Directions: Identify the choice that best completes the statement or answers the question.

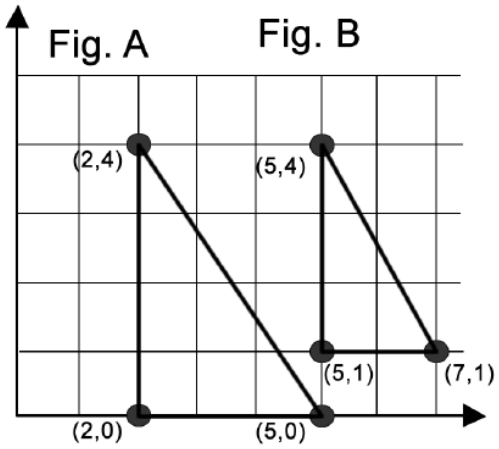
1. Simplify the following expression:

$$5^2 \times 5^{-3}$$

   A. 25^{-1}
   B. 5^{-1}
   C. 5^5
   D. 5^{2-3}

2. If f(x) = 2x - 1, what is f(x) when x = 0?
   A. 1
   B. -1
   C. 0
   D. 2

3. Describe the relationship between Figure A and Figure B.



A. Figure A and Figure B are congruent.
B. Figure A and Figure B are similar.
C. Figure A and Figure be are not congruent or similar.
D. I need more information to determine.

4. Test score data for 10 students in History and Zoography is in the chart below. Choose which answer best describes the data.

Student	1	2	3	4	5	6	7	8	9	10
History	60	55	80	39	50	20	75	68	49	90
Zoography	69	70	80	39	60	25	70	60	40	96

A. There is a positive correlation.
B. There is a negative correlation.
C. There is no correlation.
D. There is a constant correlation.

5. Which of the following is the fraction form of $0.1\overline{2}$?

   A. $\frac{12}{99}$

   B. $\frac{11}{90}$

   C. $\frac{11}{99}$

   D. $\frac{12}{100}$

6. Evaluate the following expression.

$$8^6 \div 8^2$$

   A. 8

   B. 8^3

   C. 8^7

   D. 8^4

7. Compare the following functions and determine which function has the greater rate of change.

$$y = 3x + 4$$
$$y = \frac{8}{3}x - 2$$

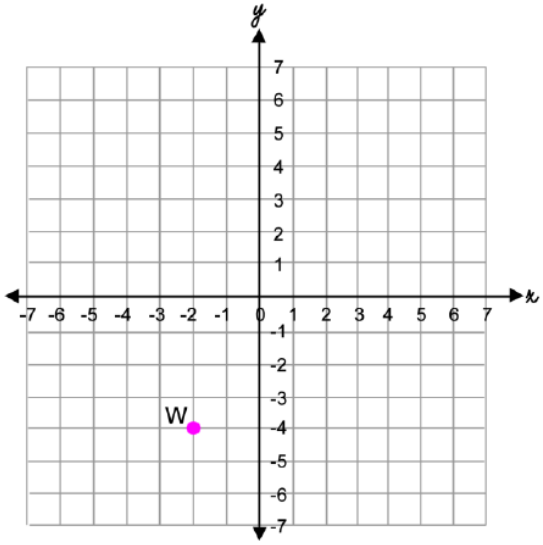
   A. $y = 3x + 4$

   B. $y = \frac{8}{3}x - 2$

   C. I need more information to determine.

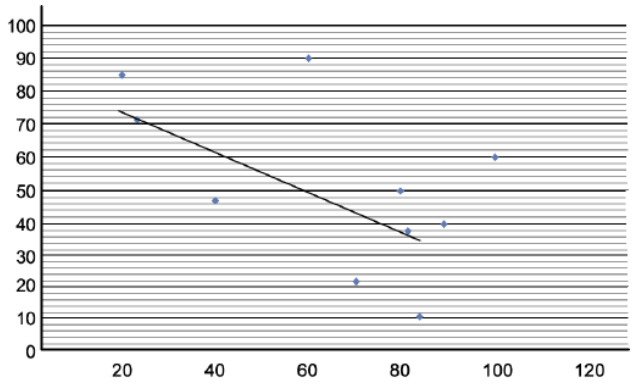
   D. The rate of change is the same for both equations.

8. Which point is the image of point W (-2,-4) after a translation of (-1, 4)?



A. (0,-3)
B. (3,-4)
C. (-7, -5)
D. (-3,0)

9. Which is an accurate description of the data in the graph below?



A. There is a positive correlation.
B. There is a negative correlation.
C. There is no correlation.
D. There is a constant correlation.

10. Which of the following is NOT a rational number?

A. $1.\overline{23}$

B. $\frac{1}{4}$

C. $\sqrt{81}$

D. π

11. Evaluate the following expression.

$$(-2a^3b^2)\ (-3a^2b^{-4})$$

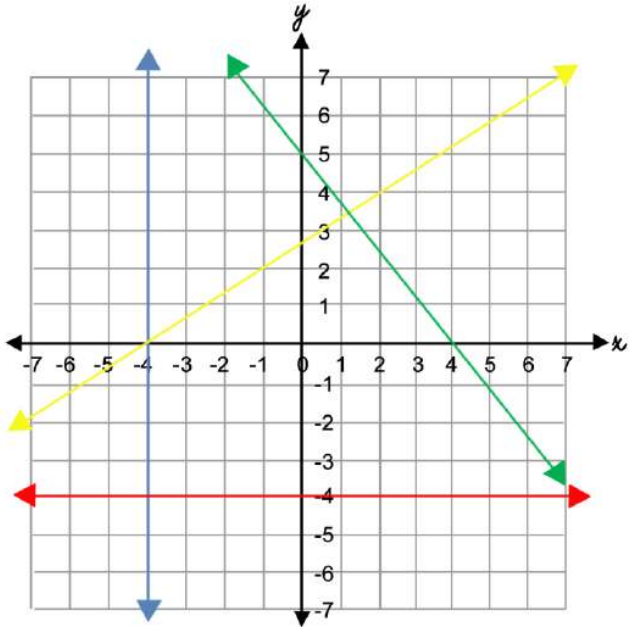
A. $\frac{6a^5}{b^2}$

B. $6ab^{-2}$

C. $-6a^5b^{-2}$

D. $-5a^5b^2$

12. Which line shows the equation x = -4?



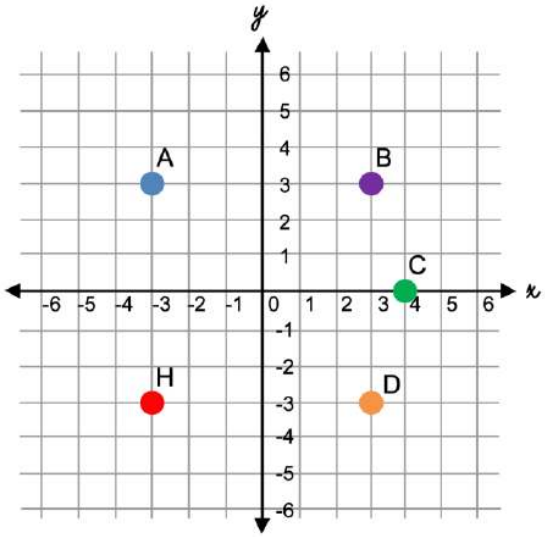
A. red

B. yellow

C. green

D. blue

13. Which point represents the image of point H after a clockwise rotation of 90° around the origin?



A. Point D
B. Point C
C. Point B
D. Point A

14. A student wanted to find out what kind of correlation there was between a students' height and their arm span. Which of the following best describes the data in the chart below?

Person	Arm Spam(cm)	Height (cm)
1	177	173
2	178	188
3	184	187
4	188	192
5	194	184
6	169	186
7	200	185

A. There is a positive relationship.
B. There is a negative relationship.
C. There is a constant relationship.
D. There is no relationship.

15. What is the approximate value of $\sqrt{39}$? (You may use a calculator)
    A. 6.24
    B. 6.23
    C. 6.25
    D. 6.26

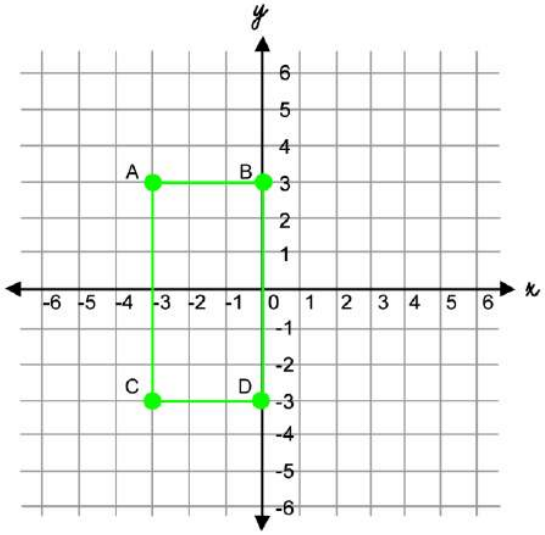
16. Evaluate 14^0.
    A. 0
    B. 1
    C. 14
    D. None of the above

17. What is the equation of the linear relationship shown in the function table?

x	y
2	7
5	16
6	19

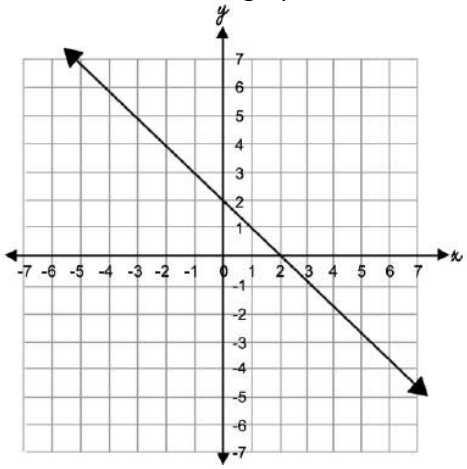
    A. $f(x) = 4x - 1$
    B. $f(x) = 2x + 3$
    C. $f(x) = 3x + 1$
    D. $f(x) = 5x - 3$

18. Which of the following would be the coordinates of point B after a dilation factor of 2?



A. (6,0)
B. (0,6)
C. (3,3)
D. (1,5)

19. What is the slope of the line shown in the graph below?



A. 1
B. -1
C. 2
D. -1

20. If the following numbers were placed in order from least to greatest, which number would be the fourth number? You may use a calculator.

$$3\pi \quad 2\sqrt{6} \quad \frac{16}{87} \quad \sqrt{12} \quad \frac{77}{17}$$

A. $2\sqrt{6}$

B. $\frac{77}{17}$

C. $\sqrt{12}$

D. $\frac{16}{87}$

21. What is the value of x if $x^2 = 81$?

A. 0

B. 18

C. 3

D. 9

22. Which of the following is the equation for a line that passes through the point (-2, 3) and has a slope of -1?

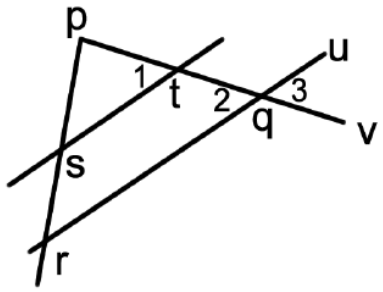
A. $y = x + 3$

B. $y = 2x - 2$

C. $y = -x + 1$

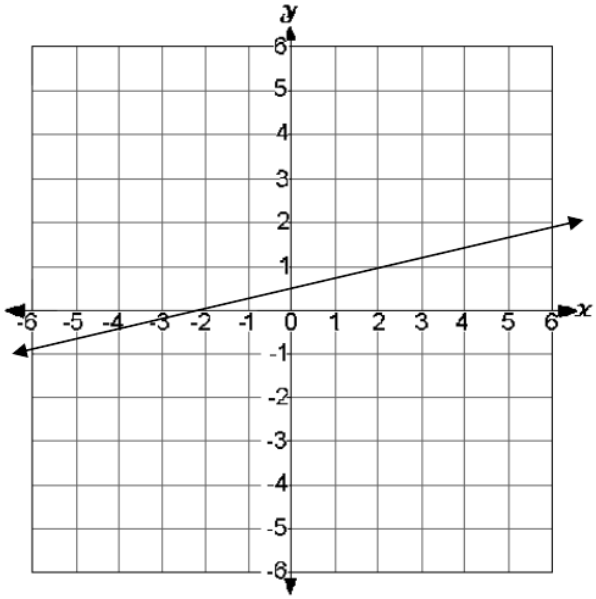
D. $y = x + 1$

23. ST is parallel to RU. What is the m ∠ 3 if the m ∠ 1 = 54°?



A. 36°
B. 126°
C. 54°
D. More information is needed.

24. Calculate the slope of the line shown in the graph below.



A. 1
B. 2
C. $\frac{1}{4}$
D. $\frac{1}{3}$

25. Which of the following is the decimal representation of $\frac{2}{9}$?

A. 0.19

B. 1.2

C. $0.2\overline{3}$

D. $0.\overline{2}$

26. What is the value of y if $y^2 = \frac{16}{25}$?

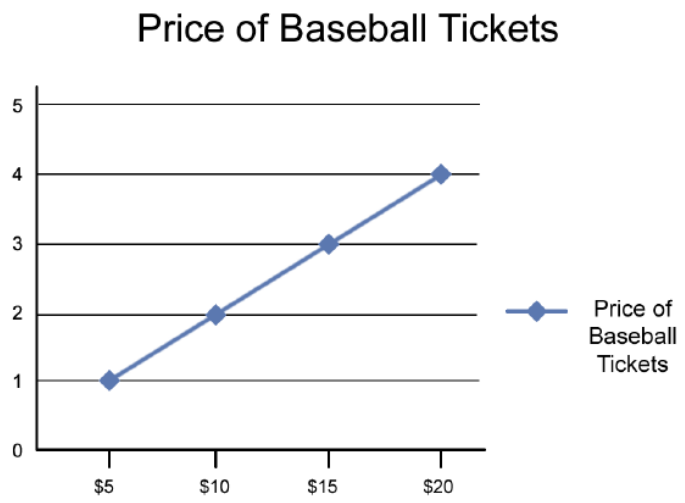
A. $\frac{8}{12}$

B. $\frac{2}{5}$

C. $\frac{4}{5}$

D. $\frac{4}{7}$

27. Describe the relationship in the graph below.



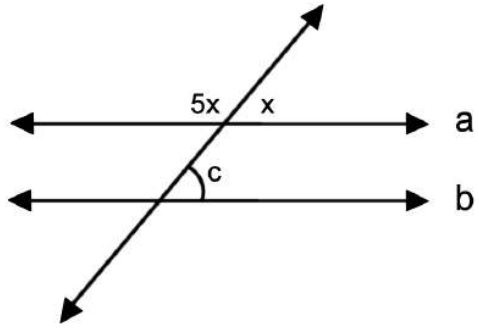
A. The relationship is non-linear.

B. The relationship is linear.

C. The relationship is not proportional

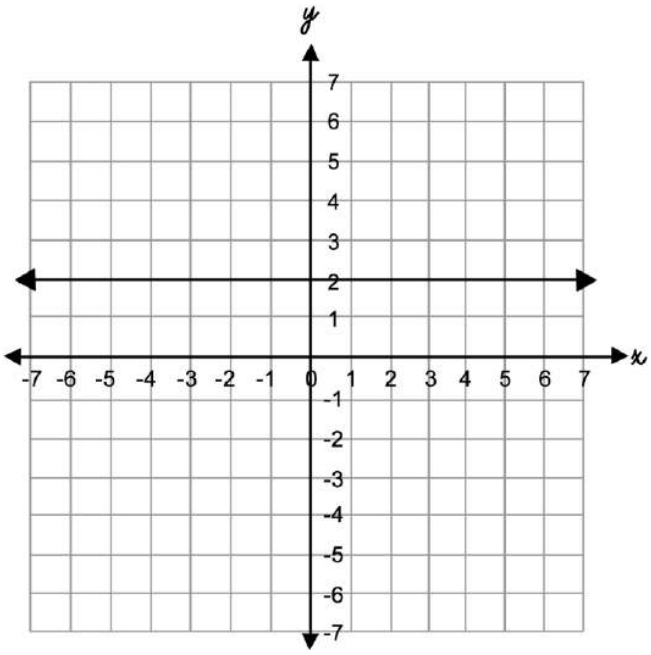
D. There is no relationship.

28. If line a is parallel to line b, then what is the measure of angle C?



A. x°
B. 60°
C. 30°
D. 50°

29. Calculate the slope of the line in the graph below.



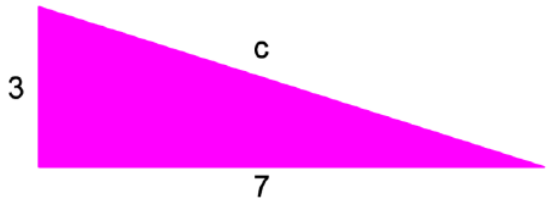
A. 1
B. 0
C. -1
D. undefined

30. When you cannot write a real number as a fraction, it is called which of the following?
    A. real number
    B. imaginary number
    C. irrational number
    D. rational number

31. Evaluate $\sqrt[3]{64}$.
    A. 8
    B. 4
    C. 16
    D. 2

32. Describe the function y = 2.
    A. The function is non-linear.
    B. This is not a function
    C. The function is a straight horizontal line.
    D. The function is increasing

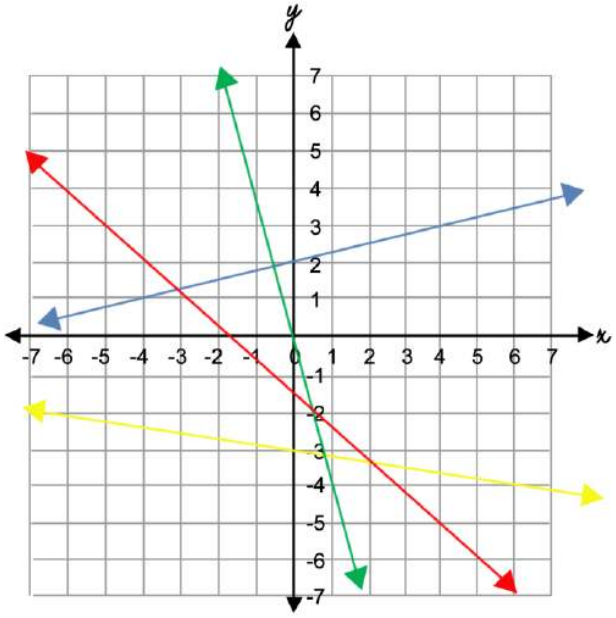
33. What is the length of the hypotenuse of the right triangle below?



    A. 10
    B. $\sqrt{10}$
    C. $\sqrt{58}$
    D. 10.5

34. Which line below is the graph of this function?

$$f(x) = \frac{1}{4}x + 2$$



A. blue
B. yellow
C. red
D. green

35. What kind of number is $\sqrt{41}$?
A. Rational
B. Irrational
C. Integer
D. Whole

36. Which of the following has the largest value?
A. 5×10^5
B. 2×10^7
C. 8×10^3
D. 4×10^4

37. A line has a slope of 3 and passes through the point (1,4). What is the equation of the line?
    A. $y = 4x + 2$
    B. $y = -x + 3$
    C. $y = 2x - 1$
    D. $y = 3x + 1$

38. Given the right triangle ABC, the distance from A to B is 8 meters and the distance from B to C is 6 meters. What is the length from A to C?
    A. 14 meters
    B. 10 meters
    C. 2 meters
    D. 7 meters

39. The given table shows college students that are either Science Majors or Math Majors and the type of computer they primarily use. Calculate the percentage of Science Majors that use a computer. Round to the nearest percent.

Students	Laptop	Computer
Student of Science	200	100
Student of Math	400	300

    A. 100%
    B. 66%
    C. 33%
    D. 10%

40. What kind of number is $3.7\overline{8}$?
    A. Whole
    B. Natural
    C. Irrational
    D. Real

41. Solve. Express your answer in scientific notation.

$$7 \times 10^3 + 8.2 \times 10^5$$

A. 1.52×10^4

B. 827×10^5

C. 8.27×10^5

D. 15.2×10^8

42. Which of the following is the y-intercept of $2x + 4y = 3x - 8$?

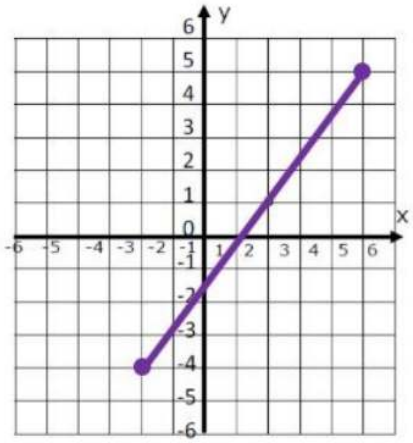
A. -2

B. -4

C. 2

D. -3

43. What is the length of $\overline{ST}$ in the coordinate plane below?



A. $\sqrt{85}$

B. 9

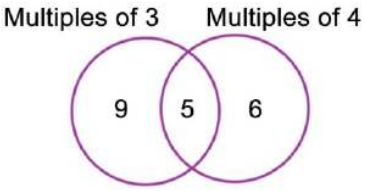
C. $\sqrt{32}$

D. $\sqrt{130}$

44. I randomly chose 20 numbers. We then classified those numbers and whether or not they were multiples of 3 or 4. We created the Venn Diagram below.

What number belongs in box c?

	Multiple of 4	Not a multiple of 4
Multiple of 3	a	b
Not a multiple of 3	c	d



A. 14
B. 9
C. 5
D. 6

45. Which of the following numbers is the smallest? You may use a calculator.

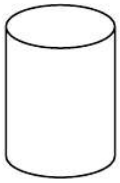
$$\frac{\pi}{\pi} \qquad \frac{4}{5} \qquad \sqrt{2} \qquad \sqrt{0.36}$$

A. $\frac{4}{5}$
B. $\frac{\pi}{\pi}$
C. $\sqrt{2}$
D. $\sqrt{0.36}$

46. Twenty-two less than two times a number is 10 more than 6 of a number. Which of the following represents that number?
A. -8
B. -4
C. 4
D. 2

47. What is the slope of the line that passes through (4,-5) and (3,-2)?
A. 4
B. -2
C. -3
D. 5

48. The cylinder below has a height of 8 inches. The base has a radius of 6 inches. Find the volume of the cylinder below.



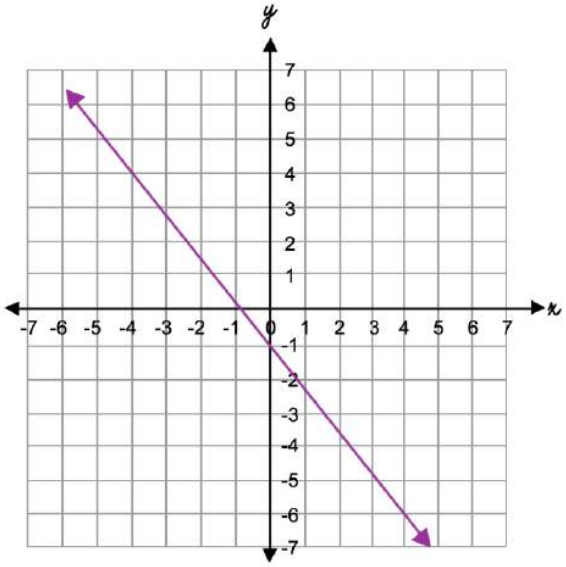
A. 288π in^3

B. 36π in^3

C. 144π in^3

D. 196π in^3

49. What is the equation of the line below?



A. $y = \frac{5}{4}x + 1$

B. $y = -x - 1$

C. $y = -\frac{5}{4}x - 1$

D. $y = \frac{5}{4}x - 1$

50. What kind of number is π?
    A. Rational
    B. Natural
    C. Irrational
    D. Integer

51. Which of the following is the solution for the set of equations/lines shown?

$$y = 4 \qquad y = \frac{1}{2}x - 2$$

    A. (4,12)
    B. (12,4)
    C. (12,6)
    D. (0,8)

ANSWERS
Mathematics - Basic
Test 1

1. B $5^2 + 5^{-3} = 5^{-1}$ We add the exponents when we have a common base.
2. B If we substitute 0 for x, then f(x) = -1.
3. C The figures are not congruent. The figures are not similar as they do not have the same rate of change.
4. A Since y increases as x increases, this is a positive correlation.
5. B X = $0.1\overline{2}$, 10x = $1.\overline{2}$, and 100x = $12.\overline{2}$. The goal is to remove the repeating part of the decimal. We will use the latter 2 equivalent equations to do so. We find the difference between the last two equations (100x - 10x = $12.\overline{2}$-$1.\overline{2}$). We get 90x = 11. Solve for x and we get x = $\frac{11}{90}$.
6. D When we divide using the same base, we subtract our exponents. $8^6 \div 8^2 = 8^4$.
7. A y = 3x + 4 has the greater rate of change. Function A has a rate of change (slope) of 3; Function B has a rate of change (slope) of 8/3. Therefore, Function A or y = 3x + 4 has the greater rate of change.
8. D The image of point W is at (-3,0).
9. B Since y decreases as x increases, this is a negative correlation or negative association.
10. D All numbers are rational, except π. Pi is an irrational number.
11. A We multiply our like bases and get $(-2a^3b^2)(-3a^2b^{-4})$. $6a^5b^{-2}$. The b^{-2} moves down to the denominator.
12. D Regardless of what y is, x is always -4.
13. D We rotate the point 90° clockwise around the origin.
14. A Overall, there is a positive relationship. As height increases, so does arm span.
15. A The approximate value of $\sqrt{39}$ is 6.24.
16. B Any number to the power of zero is equal to 1.
17. C The equation $f(x) = 3x + 4$ represents the function data in the table.
18. B The scale factor/dilation is 2. This means we multiply each point by 2 (both x and y values) and it will be twice the distance from the origin. The distance is currently (0, 3) so, when multiplied by 2, the distance shape simply gets twice as large. Point B is at (0,6).
19. B The rise is -3, the run is 3. Therefore, the slope is -1.
20. A These numbers placed in order are $\frac{16}{87}$, $\sqrt{12}$, $\frac{77}{17}$, $2\sqrt{6}$, 3π. The fourth number in the list is $2\sqrt{6}$.
21. D The square root of 81 is 9 (meaning 9 x 9 = 81).

22. C Substitute the slope and we have y = -1x + b. Substitute the (x, y) values. 3 = -1(-2) + b. This results in 3 = 2 + b. Solve for b. b = 1. Put that back into the original equation, and we get y = -x + 1.
23. C Corresponding angles tell us that since angle 1 is 54° then angle 2 is also 54°. The rule of vertical angles tells us that if angle 2 is 54° then the measure of angle 3 is 54°.
24. C The rise is 1, the run is 4. The slope is $\frac{1}{4}$.
25. D The decimal representation of $\frac{2}{9}$ is $0.\overline{2}$.
26. C The square root of $\frac{16}{25}$ is the square root of 16 divided by the square root of 25, Thus $\frac{4}{5}$.
27. B This is a linear relationship. The rate of change remains constant.
28. C If 5x + x = 180, then 6x = 180, then x = 30°. If the measure of angle x = 30°, then the measure of angle C is also 30°.
29. B The rise is 0, therefore, the slope is 0.
30. C A number that cannot be written as a fraction is called an irrational number.
31. B The cube root of 64 is 4 (meaning 4 x 4 x 4 = 64).
32. C y = 2 is a straight horizontal line where every value of x has the value of y = 2.
33. C The hypotenuse is labeled c. Square the other 2 sides and add them together, then find the square root. We get $3^2 + 7^2 = c^2$, thus $9 + 49 = c^2$. $58 = c^2$; $c = \sqrt{58}$.
34. A The blue line has a slope of $\frac{1}{4}$ and a y-intercept of 2.
35. B $\sqrt{41}$ is irrational as it is a non-perfect square.
36. B 2×10^7 has the largest value as it is 20,000,000.
37. D y = 3x + 1. We know the slope is 3, so we have the equation y = 3x + b. Substitute the values for (x, y) and we solve for b. Substitute that back into the equation to get y = 3x + 1.
38. B Use the Pythagorean Theorem to find the hypotenuse. $8^2 + 6^2 = c^2$. $36 + 64 = c^2$. $100 = c^2$. c = 10 meters
39. C We are only looking at the top row of science majors. 100 out of 300 science students (200 + 100) use a computer versus a laptop. That is 33% (rounded).
40. D $3.7\overline{8}$ is a real number.
41. C We must get a common power of 10, changing the problem into $7 \times 10^3 + 820 \times 10^3$. We add and get 827×10^3 which is not in scientific notation. 8.27×10^5 is correct.
42. A Solve 2x + 4y = 3x – 8 for y. $y = \frac{1}{4}x - 2$. The y-intercept is -2.
43. D Find the missing legs (7 and 9) by completing the right triangle. Use the Pythagorean Theorem to square each leg. $49 + 81 = c^2$. Add them together. $130 = c^2$. $c = \sqrt{130}$.
44. D Six of the numbers were a multiple of 4 but not a multiple of 3.

45. D $\sqrt{0.36}$, which equals 0.6, is the smallest of the numbers.

46. A The equation looks like this: $2x - 22 = 6x + 10$. Solving for x, we get that x = -8.

47. C The change in y is negative 3 and the change in x is positive 1. The slope is -3/1 or -3.

48. A First, find the area of the base using $A = \pi r^2$. $A = 36\pi$. Multiply by 8 to get $288\pi^{3.}$

49. C The slope is $-\frac{5}{4}$ and the y-intercept is -1 resulting in the line $y = -\frac{5}{4}x - 1$.

50. C π is an irrational number.

51. B Substitute in y into $y = \frac{1}{2}x - 2$. To get $4 = \frac{1}{2}x - 2$. x = 12. y = 4 is given. (12, 4) is the solution to these equations.

Math Questions for the MAP Exam®
8th Grade
Mathematics - Proficient
51 Questions
Test 1

Directions: Identify the choice that best completes the statement or answers the question.

1. Which of the following is an accurate description of the following number?

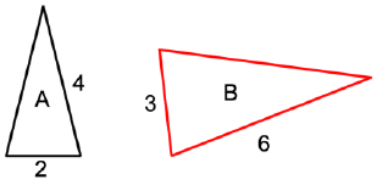
$$\frac{3\pi}{2\pi}$$

   A. rational
   B. irrational
   C. whole
   D. integer

2. If $f(x) = \frac{1}{2}x + \frac{3}{5}$, what is $f(x)$ when $x = 1$?

   A. $\frac{4}{5}$
   B. $\frac{7}{10}$
   C. $\frac{11}{10}$
   D. $\frac{1}{2}$

3. Describe the relationship between figure A and figure B.



A. Figure A and Figure B are congruent
B. Figure A and Figure B are similar.
C. Figure A and Figure B are not congruent or similar
D. There is not enough information to determine.

4. Test score data for 8 students in Math and English is in the chart below. Choose which answer best describes the data.

Student	1	2	3	4	5	6	7	8
Math	50	72	82	98	41	88	90	61
English	75	61	84	92	76	44	77	64

A. There is a positive correlation.
B. There is a negative correlation
C. There is no correlation
D. There is a constant correlation

5. Simplify the following expression.

$$8^{6} \times 8^{-3}$$

A. 8
B. 16
C. 64
D. 512

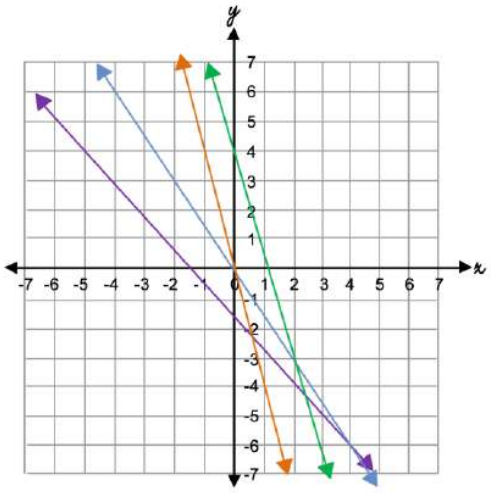
6. Simplify the following expression.

$$14^{5} \div 14^{-8}$$

A. 14^{13}
B. 14^{-3}
C. 14^{-13}
D. 14^{3}

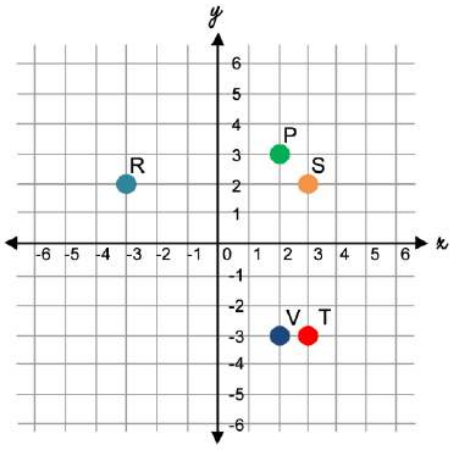
7. Which of the following is the graph of the function below?

$$f(x) = -\frac{9}{8}x - \frac{3}{2}$$



A. Orange
B. Blue
C. Green
D. Purple

8. Which of the following is the image of point R after a reflection over the y-axis and a rotation of 90° around the origin?



A. Point V
B. Point T
C. Point P
D. Point S

9. The data table below shows the sales of watermelons and potatoes. Which of the following describes the relationship between the sale of watermelons and the sale of potatoes?

Days	1	2	3	4	5
Watermelon	70	26	60	19	70
Potato	10	40	15	80	22

A. There is a positive correlation.
B. There is a negative correlation.
C. There is no correlation.

10. Which of the following is the fractional representation of $1.0\overline{42}$?

A. $10\frac{42}{100}$
B. $\frac{10}{42}$
C. $\frac{516}{495}$
D. $10\frac{21}{50}$

11. Which of the following is equivalent to the following expression?

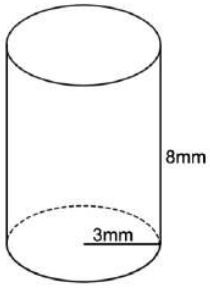
$$6^0$$

A. $6^9 \div 6^9$
B. $6^5 - 6^{-5}$
C. 1
D. All of the above

12. Which of the following has the least rate of change?

A. $f(x) = -3x - 4$
B. $f(x) = -\frac{1}{2}x + 1$
C. $f(x) = \frac{1}{4}x - 7$
D. $f(x) = \frac{1}{8}x + 1$

13. What is the volume of the cylinder below? Leave your answer in terms of π.



A. 24π
B. 48π
C. 72π
D. 144π

14. Look at the data. What kind of slope will the line of best fit have?

Temperature (c)	Rainfall (mm)
14	6
18	8
13	7
17	7
4	2

A. Positive slope
B. Negative slope
C. Zero slope
D. There is no relationship

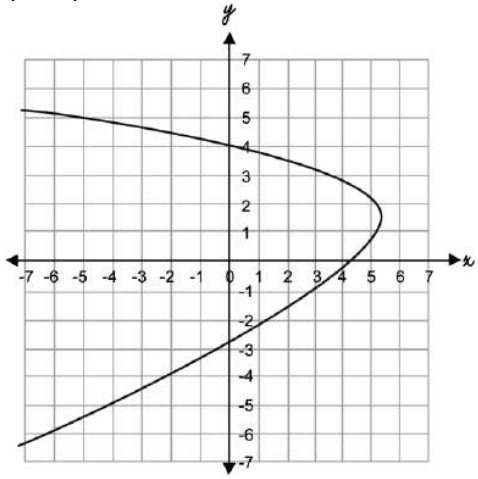
15. The $\sqrt{25}$ can be classified as all of the following except one. Which one is it not classified as?
A. Irrational
B. Whole
C. Integer
D. Natural

16. Evaluate:

$$\frac{\sqrt[3]{64}}{\sqrt[3]{8}}$$

A. 4
B. 2
C. -2
D. -4

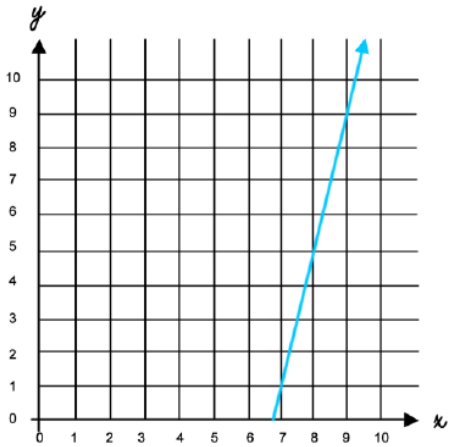
17. Does the following graph represent a function?



A. Yes, this is a function.
B. No, this is not a function.
C. I don't have enough information.

18. A 50 foot tall tree cast a shadow that is 20 feet long. What is the distance from the height of the tree to the end of the shadow? Round your answer to the nearest whole number. (You may use a calculator.)
A. 60 ft
B. 72 ft
C. 54 feet
D. 62 ft

19. What is the slope of the line graphed below?



A. $\frac{1}{4}$

B. 4

C. $\frac{2}{3}$

D. $\frac{5}{2}$

20. Which of the following is the decimal expression of $1.0\overline{4}$?

A. $\frac{49}{45}$

B. $\frac{7}{5}$

C. $\frac{14}{10}$

D. $\frac{47}{45}$

21. Which of the following shows the expression correctly in scientific notation?

0.000004832

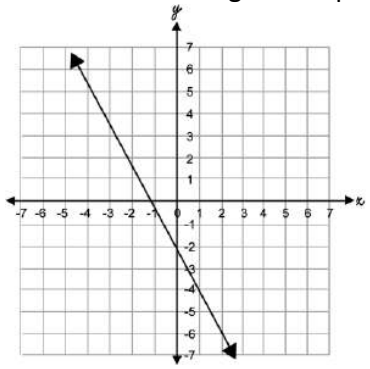
A. 483.2×10^{-8}

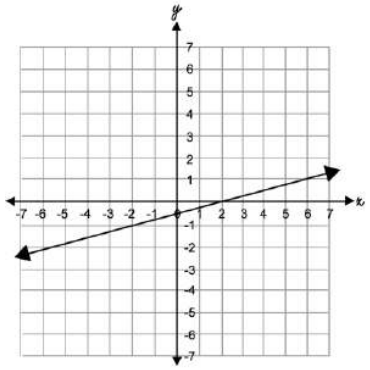
B. 4.832×10^{-6}

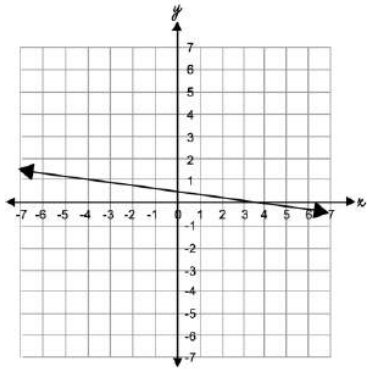
C. 483.2×10^{8}

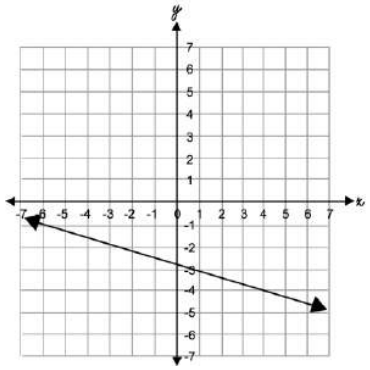
D. 4.832×10^{6}

22. Which of the following lines represents 2x – 8y = 4?

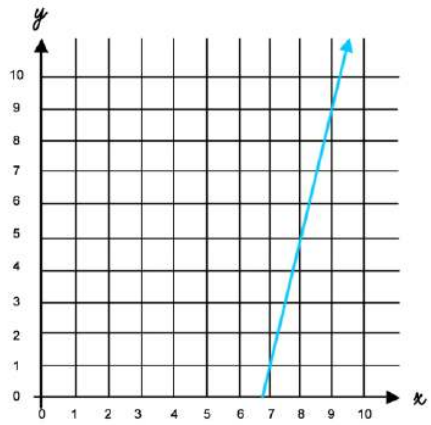
A. 

B. 

C. 

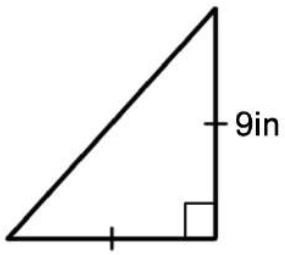
D. 

23. What is the y-intercept of the graph below?



A. -20
B. -24
C. -27
D. -29

24. What is the perimeter of the shape below? Round to the nearest tenth. (You may use a calculator.)



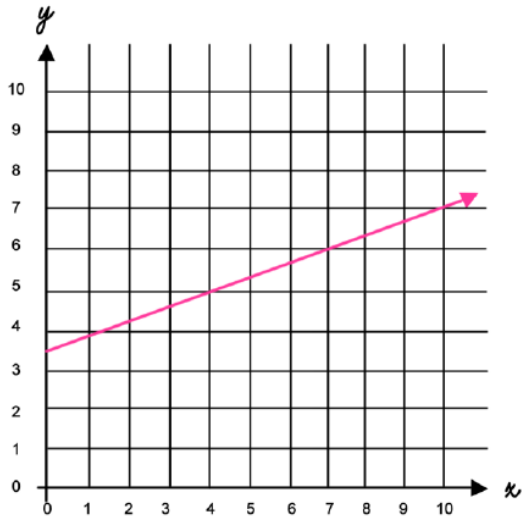
A. 31.6 inches
B. 30.7 inches
C. 25.2 inches
D. 12.7 inches

25. What kind of number is $\frac{3}{10}$?
A. Whole
B. Natural
C. Integer
D. Rational

26. The distance from Earth to Neptune is about 4.4 billion kilometers. Express this in scientific notation.
    A. 4.4×10^{8}
    B. 4.4×10^{-8}
    C. 4.4×10^{-9}
    D. 4.4×10^{9}

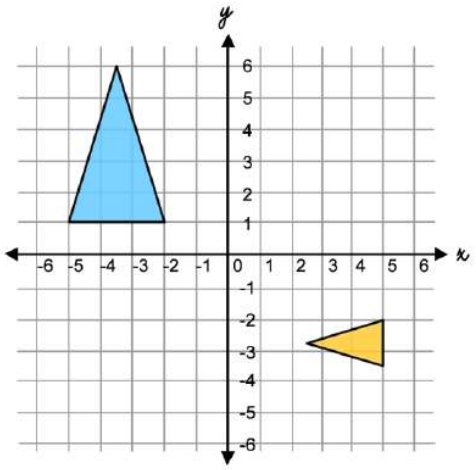
27. On Friday, Chris solves 8 math questions in one hour. If he continues at this rate, how many will he solve *completely* in 6 hours 45 minutes?
    A. 96 questions
    B. 102 questions
    C. 54 questions
    D. 112 questions

28. What is the equation of the line below?



    A. $y = \frac{1}{3}x - 3.5$
    B. $y = -\frac{1}{3}x - 3.5$
    C. $y = 3x + \frac{11}{3}$
    D. $y = \frac{1}{3}x + \frac{11}{3}$

29. What is the scale factor of the blue triangle to the yellow triangle?



A. 2

B. $\frac{1}{2}$

C. $\frac{1}{5}$

D. $\frac{2}{3}$

30. Compare $\sqrt{51}$ and $2\sqrt{10}$. (You may use a calculator.)

A. $\sqrt{51} < 2\sqrt{10}$

B. $\sqrt{51} > 2\sqrt{10}$

C. $2\sqrt{10} \geq \sqrt{51}$

D. $2\sqrt{10} \leq \sqrt{51}$

31. Calculate the following:

$$28 \times 10^{-9} + 0.04 \times 10^{-4}$$

A. 4.28×10^{-6}

B. $2.80000004 \times 10^{-10}$

C. 4.28×10^{6}

D. $2.80000004 \times 10^{-9}$

32. Which of the following shapes are congruent?

A. B and D
B. B and C
C. B and A
D. A and D

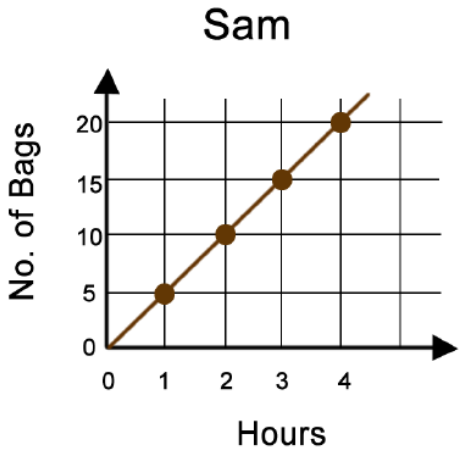
33. Many people in this world use unleaded and diesel fuels. The table below shows the number of people that use unleaded and diesel in cities X and Y. Calculate the percentage of people in city X that use unleaded. Round to the nearest whole percent. (You may use a calculator.)

No. of people	Unleaded	Diesel
City X	205	302
City Y	401	214

A. 50%
B. 40%
C. 45%
D. 48%

34. What is the closest decimal approximation of $\sqrt{180}$ to the nearest hundredth? (You may us a calculator.)
A. 13.41
B. 13.42
C. 13.43
D. 13.44

35. The graph and the equation below show how many bags Sam and Octavio can move. Who can move the most bags in 4 hours?



Octavio

y = 3x

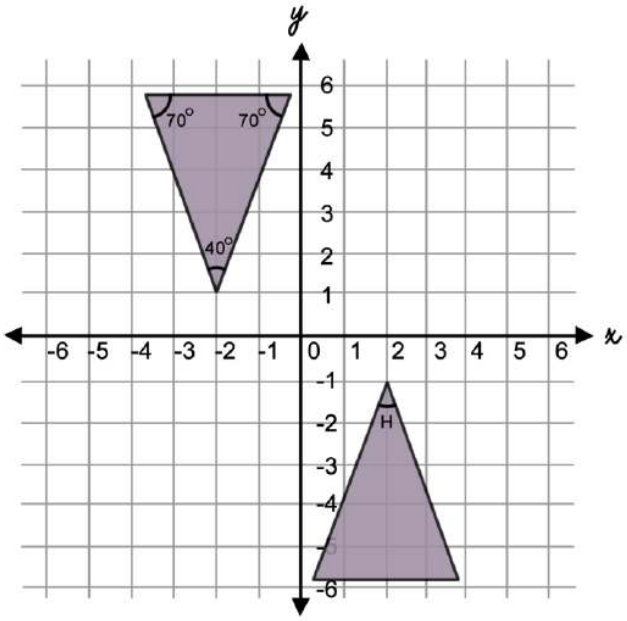
x = number of hours

y = number of bags

A. Octavio
B. Sam
C. The move the same amount
D. There is not enough information to determine.

36. Nadia learns 3 chapters of English in one week. After 5 weeks, how many chapters does Nadia learn? What is the y-intercept of the line that fits this data? Solve an equation to find the answer.
A. 14
B. 12
C. 0
D. 8

37. If triangle DEF were rotated 270° around the origin, what is the measure of angle H?



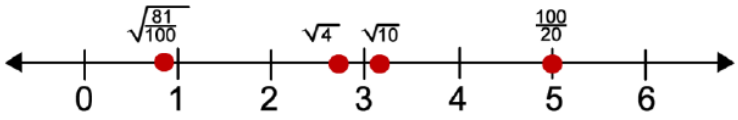
A. 70°
B. 40°
C. 110°
D. 140°

38. The data below is for 5 years showing Suzanne and George's weight in kg. Describe the association between the weight of Suzanne and the weight of George.

Year	1	2	3	4	5
Suzanne	30	40	42	49	52
George	30	35	40	45	50

A. There is a positive association.
B. There is a negative association.
C. There is no association.
D. There is not enough information to determine.

39. Which value is placed incorrectly on the number line below?



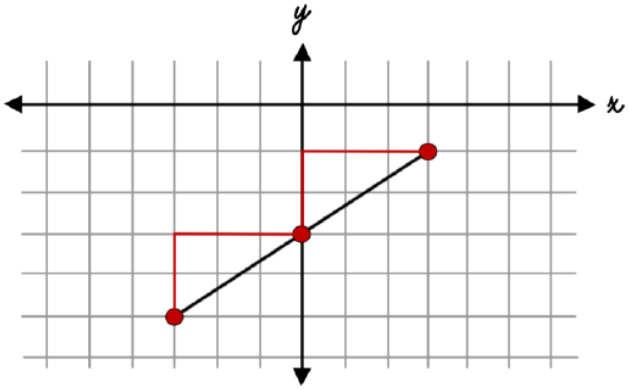
A. $\sqrt{\frac{81}{100}}$

B. $\sqrt{10}$

C. $\frac{100}{20}$

D. $\sqrt{4}$

40. Using the similar triangles below, find the slope and the equation of the line.



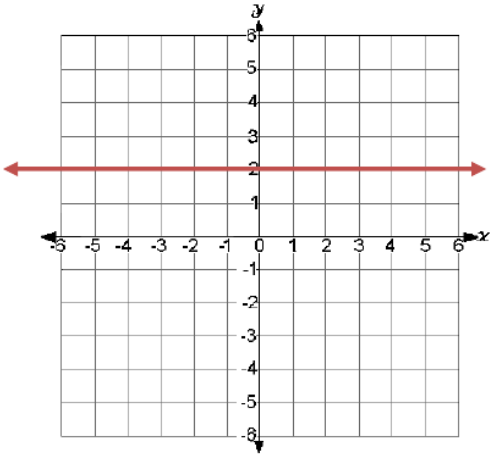
A. $y = \frac{3}{2}x - 3$

B. $y = \frac{2}{3}x - 3$

C. $y = -\frac{3}{2}x + 3$

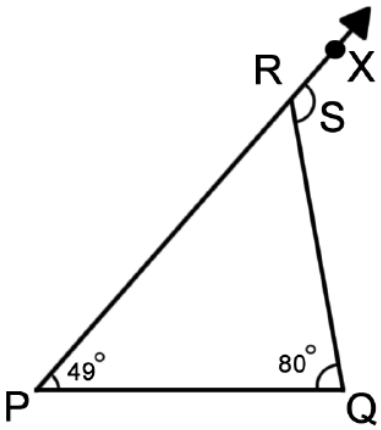
D. $y = -\frac{2}{3}x - 3$

41. What is the equation of the line shown below?



A. y = 2
B. x = 2
C. y = 0
D. x = 0

42. What is the measure of angle S?



A. 49°
B. 80°
C. 51°
D. 129°

43. Does the table show a relationship between the average hours of study and the test scores students received?

Student's Name	Average hours of study	Scores
Jacob	17	72
William	19	72
Aiden	10	47
Noah	25	75
Jayden	19	61
Ethan	14	54

A. There is a positive relationship.
B. There is no relationship.
C. There is a negative relationship.
D. There is not enough information.

44. What kind of number is 0?
A. Irrational
B. Integer
C. Natural
D. Whole

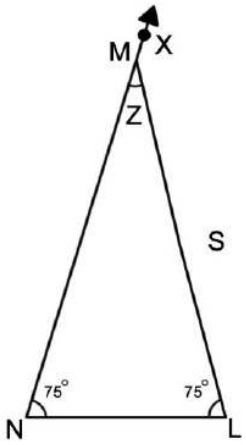
45. Solve for x.

$$2x - 7 = 23$$

A. x = 15
B. x = 8
C. x = 16
D. x = 30

46. Daisy has to deposit $45 as a tuition fee and $10 per book to get into a college. What is the y-intercept of the line that fits the data? Write expression to solve.
A. 45
B. 10
C. 10x
D. 35

47. Find the measure of angle Z.



A. 50°
B. 30°
C. 75°
D. 150°

48. Is there a relationship between the sale of coffee and tea during the seven months shown below?

Months	Coffee (Packets)	Tea (Packets)
January	75	100
February	65	180
March	50	150
April	90	90
May	80	80
June	70	35
July	40	55

A. There is a positive relationship.
B. There is a negative relationship.
C. There is no definite relationship
D. There is not enough information.

49. What kind of number is $\frac{5\pi}{2\pi}$?
A. Rational
B. Irrational
C. Regular
D. Whole

50. Yesterday, Kate and her cousin Robert went out for a movie. There they spent $50 in total. Robert spent $10 more than Kate. How much did Kate spend?
    A. $22
    B. $25
    C. $20
    D. $15

51. A line has a slope of 3 and passes through the point (-5, 2). What is the equation of the line?
    A. $y = 1/3x - 17$
    B. $y = 1/3x - 15$
    C. $y = 3x + 15$
    D. $y = 3x + 17$

ANSWERS
Mathematics - Proficient
Test 1

1. A This can be written as the fraction 3/2 so it is rational.
2. C If we substitute 1 for x, we can just get a common denominator and add the fractions that remain. f(x) = $\frac{11}{10}$.
3. B Figure A and Figure B are similar. These shapes are not the same size, so they are not congruent. They do have the same scale factor, so they are similar.
4. C There is no correlation in the test score data.
5. D We add the exponents when we multiply numbers with the same base. We get 8^3 which is 512.
6. A When dividing exponential powers having the same base, we subtract the exponents. This results in $14^{5- -8}$ or 14^{13}.
7. D The purple line has a slope of -9/8 and a y intercept of -3/2.
8. A Point V is the image after a reflection over the y-axis and a rotation around the origin.
9. C As the sale of watermelons increases, there is no correlation in potato sales.
10. C x = $1.0\overline{42}$, 10x = $10.\overline{42}$, 1000x = $1042.\overline{42}$. We find the difference of the latter two equations and get 990x = 1032. Divide by 990 and reduce $\frac{1032}{990}$ by 2 to get $\frac{516}{495}$.
11. D Choices A, B, and C are all equivalent to 1.
12. D The least rate of change is 1/8. When we compare rate of change, we compare their absolute values.
13. C V = πr2h. Using A = πr^2 to find the area of the base, we find it to be 9π. Multiply that by 8 (the height) and we get 72π.
14. A If I used this data to graph a line of best fit, it would have a positive slope.
15. A $\sqrt{25}$ = 5, therefore, it is a natural number, whole number, and an integer. It is not an irrational number.
16. B The cube root of 64 is 4. The cube root of 8 is 2. Four divided by two is 2.
17. B This is not a function because for one value of x, there are 2 values for y. You can also use the vertical line test.
18. C We use the Pythagorean Theorem to evaluate $50^2 + 20^2 = c^2$. We get that c = $\sqrt{2900.}$ This is equivalent to 53.85 rounded to 54 ft.
19. B The rise is 4, the run is 1, thus a slope of 4.
20. D x = $1.0\overline{4}$, 10x = $10.\overline{4}$, 100x = $104.\overline{4}$. Find the difference of the latter 2 equations 90x = 94, thus x = $\frac{47}{45}$
21. B This number can be expressed as 4.832 x 10^{-6}.

22. B Choice B has a line that passes through -1/2 and has a slope of ¼.
23. C The y intercept is found by using y = 4x + b since the slope is 4/1. Substituting in a point (7,1) for x and y we can solve for b (the y intercept). b = -27.
24. B To find the perimeter of an isosceles right triangle, we must first find the length of the hypotenuse. We know the other marked side is also 9 inches, and, using the Pythagorean Theorem, we find that the hypotenuse is 12.7 inches long (rounded). We then find the perimeter (9 + 9 + 12. 7) and get 30.7 inches.
25. D $\frac{3}{10}$ is a rational number.
26. D 4.4 billion is written as 4.4 x 10^9 in scientific notation.
27. C Chris can solve 54 math questions. He can solve 8 questions in 1 hour or 1 question every 7.7 minutes. In 6 hours, he can solve (8 x 6) = 48 questions. In 45 minutes, he can solve (45/7.5) 6 questions. 48 + 6 = 54 complete questions.
28. D We first find the slope (change in y/change in x) which is 1/3. We then substitute in point (1,4) for x and y, resulting in 4 = 1/3 (1) + b. Solving for b, we get 11/3. Therefore, the equation of this line is y = 1/3x + 11/3.
29. B These shapes are similar and have a scale factor of ½.
30. B $2\sqrt{10}$ is equal to about 6.32. $\sqrt{51}$ is equal to about 7.14. Therefore, $\sqrt{51} > 2\sqrt{10}$.
31. A We change the numbers into .000000028 + .000004. We get .00000428. Putting that into scientific notation yields 4.28 x $10^{-6.}$
32. B Shapes B and C are congruent (same size and shape).
33. B We divide 205 by 507 (all of the city x people) to get .404339. We round to 40%.
34. B $\sqrt{180}$ is approximately 13.42.
35. B Sam moves 5 bags per hour. Octavio moves 3 bags per hour. In 4 hours, Sam would have moved 20 bags to Octavio's 12 bags.
36. C We use the equation y = 3x where x is the number of weeks. The y-intercepts is where x = 0. Therefore, y = 3(0) results in 0. The y intercept is 0.
37. B Student will show that using translations, reflections, and rotations, angles map to angles and lines map to lines. Angle H is 40°.
38. A As Suzanne's weight increases, so does George's. This is a positive association.
39. D $\sqrt{4}$ is incorrectly labeled on the number line. $\sqrt{4}$ = 2.
40. B The slope is found by finding rise/run or change in y/change in x. This line has a slope of 2/3. The y-intercept is the point where the line crosses the y-axis This line crosses the y-axis at (0, -3). The equation is y = 2/3x − 3.
41. A The equation of this straight horizontal line is y = 2.
42. D The exterior angle is equal to the two opposite interior angles of a triangle. ∠S = 80° + 49°. ∠S = 129°

43. B There is no relationship between the average hours of study time and the test scores received. At 19 hours of study time, the relationship falls apart.
44. D Zero is a whole number.
45. A We add 7 to both sides of the equation resulting in 2x = 30. x = 15.
46. A The equation generated by the data is y = 10x + 45. The y-intercept is 45.
47. B The interior angles of a triangle must add up to 180°.
    75° + 75° + x = 180°; 150° + x = 180; x = 30°
48. C There is no relationship amongst the sales.
49. A $\frac{5\pi}{2\pi} = \frac{5}{2}$ is a rational number.
50. C 2k+10 = 50. Solve for k to get k = $20.
51. D We use y = 3x + b to solve. Substitute in (-5, 2) to solve for b. b is 17.
    The equation of the line is y = 3x + 17.

Math Questions for the MAP Exam®
8th Grade
Mathematics - Advanced
51 Questions
Test 1

Directions: Identify the choice that best completes the statement or answers the question.

1. Simplify.

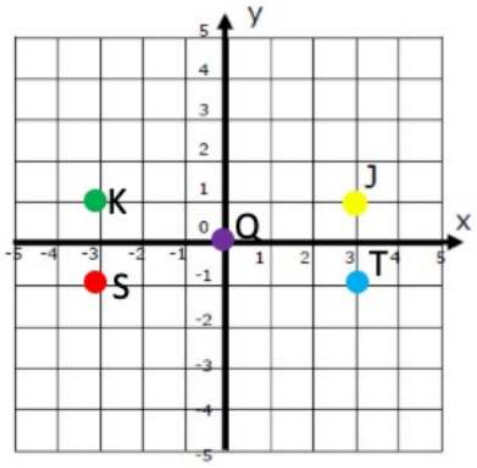
$$4^{-2} \times 4^{6}$$

A. 1248
B. 624
C. 64
D. 256

2. What set of numbers completes this data table?

A. 1, -2, 4, 8
B. 1, 4, 7, 9
C. 1, 3, 7, 9
D. 1, 3, 9, 10

3. Which point is the reflection of point J over the y-axis?



A. Point S
B. Point T
C. Point K
D. Point Q

4. Of 150 students in Elmbridge High school, the attendance of students in Mr. Jones' Chemistry and Physics classes was placed in the data table below. What is the percentage of total students attending Physics on Day 2?

No. of Days	Chemistry	Physics
Day 1	122	110
Day 2	115	135

A. 73%
B. 88%
C. 90%
D. 55%

5. Which of the following most accurately describes the following?

$$\frac{5\pi}{3\pi}$$

A. real
B. imaginary
C. irrational
D. integer

6. Simplify. $\frac{8^{-2}}{5^4}$

A. $\frac{64}{625}$

B. $\frac{1}{4000}$

C. $\frac{1}{40000}$

D. $-\frac{64}{625}$

7. What is the function equation that matches the data in the table below?

x	0	2	5	3
y	3	9	18	12

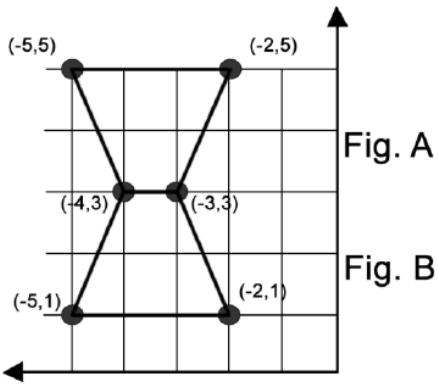
A. f(x) = 3x

B. f(x)= 3x + 3

C. f(x) = 2x − 3

D. f(x) = $\frac{1}{3}$x + 3

8. What series of transformations occurred to map Figure A onto Figure B?



A. A reflection over x = 3 and a translation of x = -2.

B. A translation of y =-2 and a rotation of 90° around point (-4, 3)

C. A rotation of 180°around point (-5, 3)

D. A reflection over a line at y = 3.

9. The chart below shows the number of men and women to attend a college class over 10 years. Which of the following would describe the association between the number of men and women?

Year	1	2	3	4	5	6	7	8	9	10
Men	22	47	84	12	26	33	44	54	71	68
Women	22	58	61	53	43	81	86	94	50	94

A. There is a positive correlation.
B. There is a negative correlation.
C. There is a constant correlation.
D. There is no correlation.

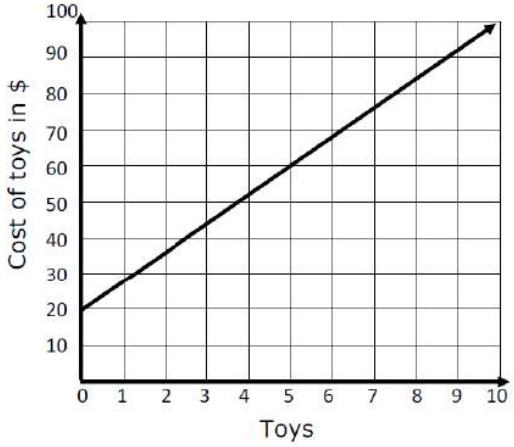
10. Which of the following is $0.00\overline{8}$ as a fraction?

A. $\frac{7}{900}$
B. $\frac{8}{900}$
C. $\frac{8}{90}$
D. $\frac{7}{90}$

11. Simplify $(9^3)^3$

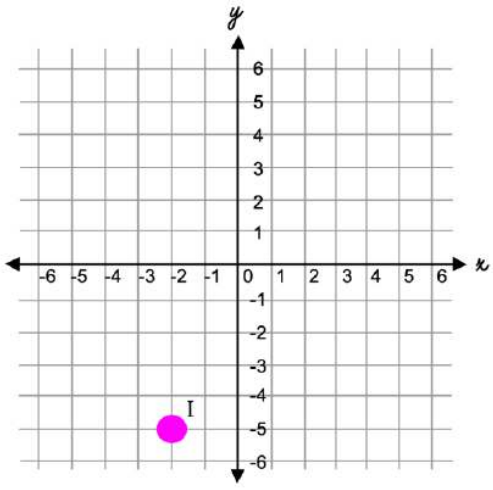
A. 9^6
B. 9^9
C. 9^2
D. 81

12. This graph shows how much money Sam spent on toys. If Sam has $50 to spend, what is the maximum number of toys he can purchase?



A. 4 toys
B. 3 toys
C. 5 toys
D. 2 toys

13. What will be the coordinates of the point I ,(-2,-5), if it is rotated 90˚counterclockwise around the origin?



A. (5, 2)
B. (2, 5)
C. (-2, 5)
D. (5, -2)

14. What kind of relationship exists between the temperature and latitude?

Cities	Temperature	Latitude
Los Angeles	50	40
Chicago	60	37
Houston	69	32
Dallas	41	44
San Jose	46	41
Boston	55	38
Denver	82	27

A. Positive
B. Negative
C. No relationship
D. I need more information.

15. Which of the following is irrational?
A. 0.8526417…
B. $\sqrt{3}$
C. 16π
D. All of the above

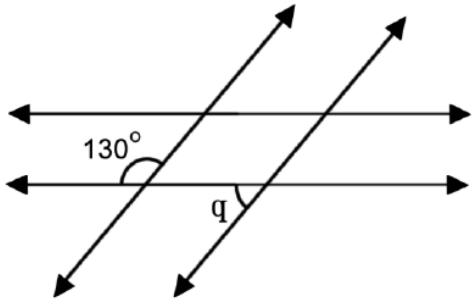
16. Simplify: $\sqrt[3]{64} \times 9^0$
A. 4
B. 0
C. -2
D. 3

17. Compare the following functions to determine which has a negative slope.

f(x) = 15 – 5d f(x) = -3 + 7d

A. f(x) = 15 – 5d has a positive slope
B. f(x) = 15 – 5d has a negative slope
C. f(x) = -3 + 7d has a negative slope
D. None of the above

18. What is the measure of angle q?



A. 130°
B. 30°
C. 70°
D. 50°

19. Is there any relationship between the sale of pens and ink bottles? If so, what kind of relationship?

Company name	Number of pens	Ink bottles
Rotring	100	300
Parker	200	150
Pilot	300	200
Crayola	400	325
Expo	500	250
BIC	600	400
Reynolds	700	500

A. No, there is no relationship.
B. Yes, there is a positive relationship.
C. Yes, there is a negative relationship
D. Yes, there is a constant relationship.

20. Which of these is $\frac{29}{9}$ in decimal form?

A. $3.\overline{1}$
B. $3.\overline{3}$
C. $3.\overline{2}$
D. $3.\overline{5}$

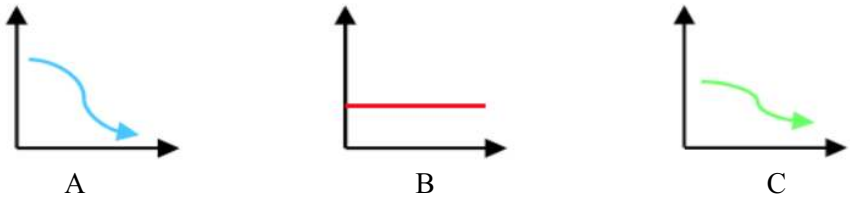
21. Which is larger: 2×10^6 or 9×10^4 ?

A. They are equal

B. 9×10^4

C. 2×10^6

22. Which of the following is linear?



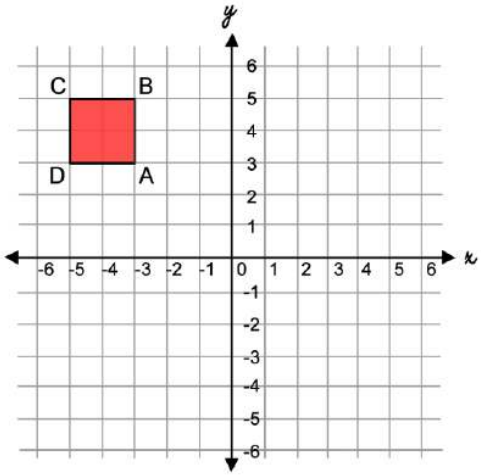
A. Figure A is linear.

B. Figure B is linear.

C. Figure C is linear.

D. None of the above.

23. Dilate the following shape by ½ around the origin. What is the coordinate of the new point A?



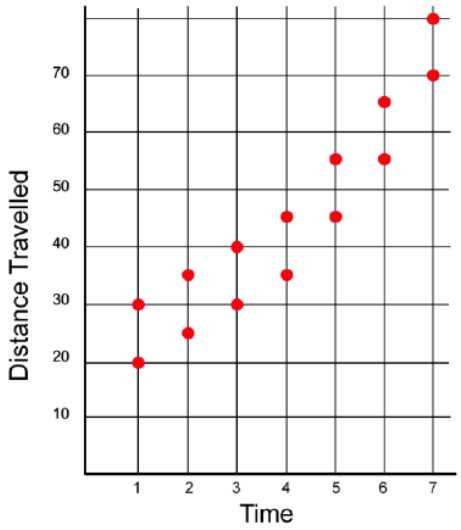
A. (-2, 2)

B. (-1, 1)

C. $(-\frac{3}{2}, \frac{3}{2})$

D. $(-\frac{5}{2}, 5)$

24. What is the best estimate of the distance traveled at time = 8?



A. 70
B. 60
C. 80
D. 50

25. Which of the following sets of real numbers are in the correct order from least to greatest?

A. 0.25, $\frac{1}{2}$, $\sqrt{.36}$, .36

B. 0.25, 0.36, $\frac{1}{2}$, $\sqrt{.36}$

C. $\sqrt{.36}$, 0.36, $\frac{1}{2}$, 0.25

D. 0.36, $\sqrt{.36}$, 0.25, $\frac{1}{2}$

26. Evaluate the following expression. $(-3z^2y)(4z^3y^{-2})$

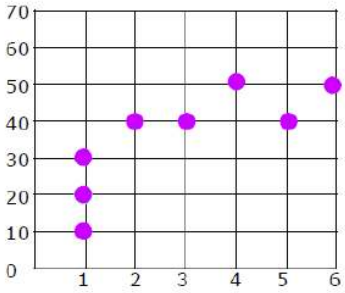
A. $2z^5y^1$

B. $z^6\ y^{-1}$

C. $-12z^5y^2$

D. $\frac{-12z^5}{y}$

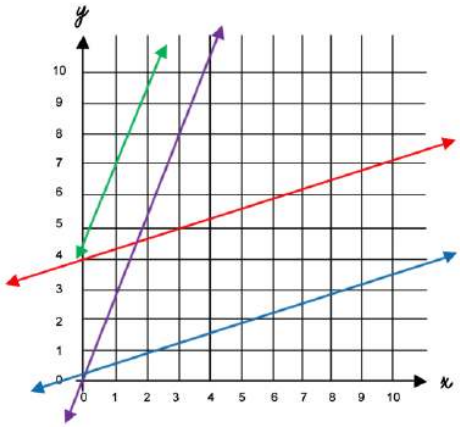
27. Which of the following is a description of the graph below?



A. The graph is linear.
B. The graph is nonlinear.
C. The graph is constant.
D. None of the above.

28. A triangle has sides with lengths of 28 m, 32 m. Calculate the length of the hypotenuse. Round to the nearest tenth. (You may use a calculator)
A. 39.8 m
B. 45.2.m
C. 42.5 m
D. 37.7 m

29. Which line shows y = $\frac{1}{3}x + 4$?



A. green
B. purple
C. red
D. blue

30. Between which pairs of rational numbers does $\sqrt{72}$ lie on the number line?
    A. 8.0 and 8.1
    B. 8.2 and 8.3
    C. 8.35 and 8.45
    D. 8.45 and 8.55

31. Estimate to the nearest hundredth $\sqrt{97}$.
    A. 9.89
    B. 9.79
    C. 9.84
    D. 9.85

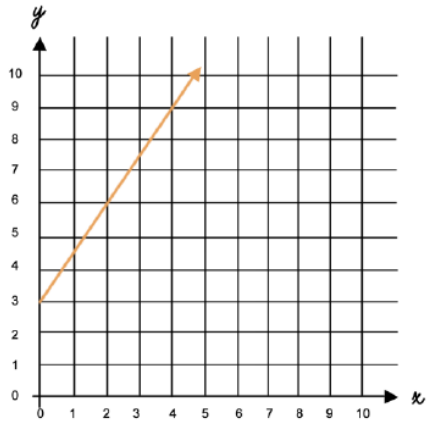
32. Which of the following describes the data in the table?

x	*y*
0	0
1	5
2	10
3	15

    A. The data is linear.
    B. The data is nonlinear.
    C. The data has a slope of 1.
    D. The data has a negative slope.

33. Matt and Catt are twin brothers. Their mother wants to equally divide a rectangular shaped cake of 5 in wide and 6 in long. Find the length of the third side of the cake, if it were cut diagonally. Round your answer to the nearest tenth. (You may use a calculator.)
    A. 7.1 inches
    B. 7.9 inches
    C. 7.8 inches
    D. 7.5 inches

34. Identify the equation of the graph shown below.



A. $y = \frac{3}{2}x - 3$

B. $y = \frac{3}{2}x + 3$

C. $y = \frac{2}{3}x + 3$

D. $y = \frac{2}{3}x - 3$

35. 10 less than five of a certain number is fourteen more than 7 times that number. What is the number?

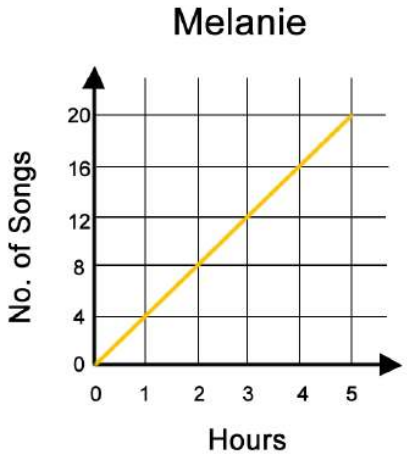
A. 7

B. 12

C. 14

D. -12

36. The graph below shows the rate at which Melanie listens to songs. Jesse also listens to songs and her rate is shown using the equation to the right. Over a one-day period, who listens to more songs?



Jesse

y = 2x
x = Hours
y = number of songs

A. Melanie listens to more songs
B. Jessie listens to more songs
C. They have the same rate.
D. I don't have enough information.

37. Find the slope of the line that passes through (5, 8) and (3, 4).

A. The slope is 2.
B. The slope is -2.
C. The slope is $\frac{1}{2}$.
D. The slope is $-\frac{1}{2}$.

38. Alaska is 3,186 miles from California and California is 2,774 miles from Florida. Assuming the roads between the three states made a right triangle, find the distance from Alaska to Florida. Round your answer to the nearest whole mile. (You may use a calculator.)

A. 4,224 miles
B. 4202 miles
C. 3988 miles
D. 3345 miles

39. Seven-hundred fifty people from New York and 1,800 people from Houston were surveyed. People were asked if they preferred Pepsi or Coca Cola. Calculate the percentage of New Yorkers who prefer Pepsi.(You may use a calculator.)

City	Coca Cola	Pepsi
New York	500	250
Houston	800	1000

A. 70%

B. 67%

C. 33%

D. 31%

40. Line A and B have the following points: Line A: (8, 4) and (-4, 7) Line B: (8, 4) and (-3, -9). Find the point where the two lines intersect.

A. $(1, \frac{3}{2})$

B. (-2,7)

C. (8,4)

D. (-4, 7)

41. Charlene reads at a constant rate. She can read 6 pages in 12 minutes. What is the equation that represents how many pages, p, Charlene can read after t minutes?

A. $p = \frac{1}{2}t$

B. p = 2t

C. $t = \frac{1}{2}p$

D. t = 2p

42. A line has a slope of -6 and passes through the point $(-2, 4)$. What is the equation of the line?

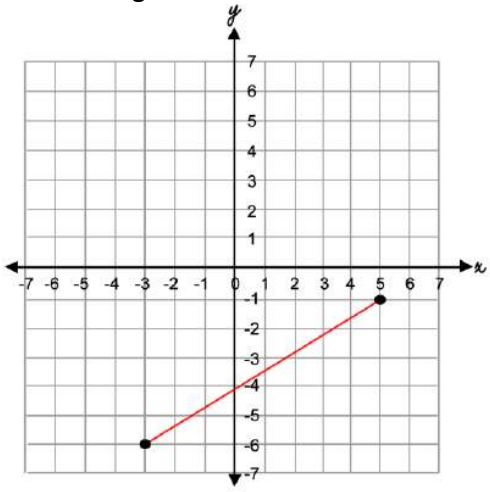
A. $y = -6x - 8$

B. $y = 6x - 8$

C. $y = -6x + 8$

D. $y = -\frac{1}{6}x - 8$

43. What is the length of the line segment shown in the coordinate plane below?



A. $\sqrt{80}$

B. $\sqrt{89}$

C. $\sqrt{79}$

D. $\sqrt{85}$

44. The table below shows the number of people that wear Reebok and Nike brand shoes in Alabama and Alaska. What is the percentage of people from Alaska that wear Nike shoes? (You may use a calculator.)

State	Reebok	Nike
Alabama	950	600
Alaska	1050	825

A. 47%

B. 58%

C. 40%

D. 44%

45. Line A and B have the following points: Line A: (3, 2) and (1, 6) Line B: (8, 4) and (-2, -1) Find the point where the two lines intersect.

A. $(\frac{16}{5}, \frac{8}{5})$

B. $(\frac{15}{2}, 6)$

C. $(3, \frac{5}{2})$

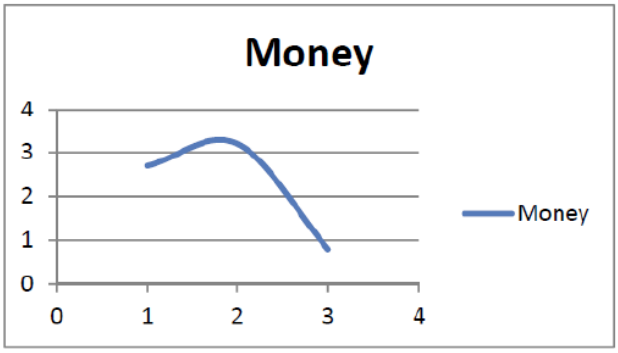
D. $(6, -1)$

46. Charlene reads at a constant rate. She can read 6 pages in 12 minutes. About how long will it take Charlene to read 25 pages using the equation below.

$$p = \frac{1}{2}t$$

A. 37 minutes
B. 13.5 minutes
C. 50 minutes
D. 45 minutes

47. Which of the following descriptions accurately describes the graph between 2 and 3?



A. The graph is linear and increasing.
B. The graph is nonlinear and positive.
C. The graph is nonlinear and decreasing.
D. The graph is linear.

48. A guest house is in the shape of a cone. The house is 7.5 feet high, 22 feet long. Find the volume of air that occupies the house, assuming it is empty.
A. 907.5π
B. 40.3π
C. 298.2π
D. 302.5π

49. The Federal Height Authority is conducting a survey in which they are looking for people taller than six and half feet. They surveyed 400 people from each town. The table shows number of men and women that meet the height requirement. Find the percentage of men in St. Louis that are taller than six and a half feet. Round to the nearest whole percent. (You may use a calculator.)

Name of City	Men	Women
St. Louis	18	20
Chicago	8	12

A. 10%
B. 5%
C. 90%
D. 15%

50. Which of the following describes the set of numbers that follows?

$$\sqrt{25} \qquad -\frac{9}{3} \qquad \frac{\pi}{\pi} \qquad 6^0 \qquad \sqrt[3]{125}$$

A. Real, Rational, Integers
B. Real, Rational, Integers, Whole
C. Real, Irrational, Whole
D. Real, Rational, Integers, Whole, Natural

51. Water is dripping from a bathtub faucet at a rate of 1/4 gallons per minute. How much will leak each hour?
A. 20 gallons
B. 5 gallons
C. 10 gallons
D. 15 gallons

ANSWERS
Mathematics - Advanced
Test 1

1. D When base is the same, add the exponents. This simplifies to 4^4 which is 256.
2. C Substitute -2, -1, 1 and 2 in for x using the equation f(x) = 2x + 5. 1, 3, 7, 9 is the solution set for the data table.
3. C Point J reflected over the y-axis is Point K.
4. C We divide the 135 students by the 150 students enrolled to get .90, or 90%.
5. A The π's cancel each other out, leaving $\frac{5}{3}$. This is real number.
6. C The 8^{-2} moves to the denominator and the exponent becomes positive. We then Multiply 8x8x5x5x5x5 in the denominator to get 40,000. $\frac{1}{40000}$ is the answer.
7. B Using the point (0,3) we know the y-intercept is positive 3. Finding the relationship between the other numbers, we find that the equation f(x)= 3x+3 works for all values.
8. D This shape was simply reflected over a line at y = 3.
9. D As x increases, there is no correlation amongst y values.
10. B We set x = $0.00\overline{8}$. We then set 10x = $.0\overline{8}, 100x = .\overline{8}$, and 1000x = $8.\overline{8}$. We find the difference of the last two equations. 900x = 8. Solve for x and we get $\frac{8}{900}$.
11. B We multiply the exponents when separated by parentheses. 9^9 is correct.
12. B Four toys would cost just over the $50 limit Sam has. He can only purchase 3 toys without exceeding his limit.
13. D Point I, rotated 90° counterclockwise around the origin results in the image of Point I being at (5, -2).
14. C As the x value (temperature) increases, the y values (latitude) both increase and decrease demonstrating that there is no relationship amongst the data given.
15. D All of these are irrational.
16. A $\sqrt[3]{64}$ = 4 and 9^0 = 1. Thus 4 x 1 = 4.
17. B f(x) = 15 – 5d has a negative slope. Slope is determined by the coefficient of x when an equation is solved for f(x) or y. f(x) = -5d + 15 where -5 is the slope.
18. D The measure of the angle to the right of the 130° is 50°. They are corresponding angles. Vertical angles tell me that the measure of angle q is also 50°.
19. A As the x values increase (no. of pens), the y values (no. of ink bottles) both increase and decrease demonstrating that there is no relationship amongst the data given.
20. C $\frac{29}{9}$ is 3 and $\frac{2}{9}$. As a decimal, it is written as $3.\overline{2}$.
21. C 2 x 10^6 is 2000000. 9 x 10^4 is 90000.
22. B Figure B is linear (it makes a straight line).

23. C We simply multiply the existing coordinate points for Point A by 1/2 to get the Coordinate points of the image of Point A. $(-\frac{3}{2}, \frac{3}{2})$

24. C We make estimates based on an imaginary line of best fit. The best estimate of the distance traveled when time = 8 is 80.

25. B Choice B lists the real numbers in order from least to greatest. 0.25, 0.36, $\frac{1}{2}$, $\sqrt{.36}$

26. D When we multiply numbers with the same base, we add the exponents. In addition, when we have a negative exponent, we flip it to the denominator and make the exponent positive.

27. B The graph shows a function that is nonlinear. It does not make a line.

28. C $a^2 + b^2 = c^2$. $28^2 + 32^2 = c^2$. $C^2 = 1808$. The square root of 1808 is 42.5 rounded to the nearest tenth.

29. C The red line shows the graph of $y = \frac{1}{3}x + 4$, with the y intercept of 4 and slope of 1/3.

30. D $\sqrt{72}$ lies at about 8.48, placing it between 8.45 and 8.55 on the number line.

31. D $\sqrt{97}$, we know through intuition is close to $\sqrt{100}$ or 10. Using a number line and benchmarks, we can determine that $\sqrt{97}$ rounds to 9.85. 9.85 x 9.85 = 97.0225.

32. A The data is the table is linear, proportional, and has a slope of positive 5.

33. C $a^2 + b^2 = c^2$. $5^2 + 6^2 = c^2$. $C^2 = 61$. We then find the $\sqrt{61}$ to get about 7.8 inches.

34. B The slope of the graph is $\frac{3}{2}$. The y-intercept is at positive 3. The equation of the line of this graph is $y = \frac{3}{2}x + 3$.

35. D The equation for this word problem is 5x - 10 = 7x + 14. Solving for x, we get x = -12.

36. A Melanie has a rate of 4 songs per hour and Jesse has a rate of 2 songs per hour. Over a day, Melanie will listen to more songs.

37. A The slope is found by using change in y/change in x. slope = 4/2 = 2

38. A $a^2 + b^2 = c^2$. $3186^2 + 2774^2 = c^2$. $c^2 = 17{,}845{,}672$. We find the square root of 17,845,672 to get 4224 miles.

39. C We calculate the 250 New Yorkers that prefer Pepsi and divide by the 750 New Yorkers surveyed to get a result of 33%.

40. C The first given point for each line is (8,4). They intersect at that point.

41. A The equations $p = \frac{1}{2}t$, represents the number of pages Charlene can read in a number of minutes, t.

42. A We use -6 as the slope, substitute in (-2, 4) for x and y to solve for b. We find that $b = -8$ The equation is $y = -6x - 8$.

43. B Form a right triangle with sides measuring 5 and 8 to find the unknown measure of the line (or side). $a^2 + b^2 = c^2$. $5^2 + 8^2 = c^2$. $c^2 = 89$. The line is equal to $\sqrt{89}$.

44. D We take the 825 Alaskans that prefer Nike and divide by the total number of Alaskans surveyed (1,875) to get a result of 44%.

45. A We find the slope and substitute one point to solve for b to get the equation. Do this for each pair of points. We get y = $\frac{1}{2}$ x and y = -2x + 8. Solve for the system of equations using elimination or substitution, and we get that the solution to the set of Equations is ($\frac{16}{5}$, $\frac{8}{5}$).

46. C We substitute 25 for p; 25 = ½ t. Solve for t, time. Minutes = 50

47. C The graph is nonlinear and decreasing between 2 and 3.

48. D $V = \pi r^2 h/3$. We find the area of the base by using πr^2 (121π). We then multiply the area of the base by the height. 121π x 7.5 = 907.5π. We then divide by 3 to get 302.5π.

49. B We divide the 18 men from St. Louis by the 400 surveyed to get .045 or 5% rounded.

50. A The set of numbers given are Real, Rational, Integers.

51. D We use w = ¼ t to determine the answer. Replace t with 60 (minutes) to get 15 gallons leak after one hour.

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