

Name: _____ () Class: _____

Instructions:

1. The time allowance for this paper is 35 minutes.
2. Answer all questions. Write your answers in the spaces provided.
3. Unless otherwise specified, all workings must be clearly shown.
4. Unless otherwise specified, numerical answers should be either exact or correct to 3 significant figures.

Section A Multiple Choice Questions (20 marks)

Choose the best answer for each question.

1. Factorize $3 - 8x - 3x^2$.
A. $(x-3)(3x-1)$ B. $(x+3)(3x-1)$ C. $(x-3)(1-3x)$ D. $(x+3)(1-3x)$
2. Factorize $8x^3 + 27y^3$.
A. $(2x+3y)(4x^2 + 12xy + 9y^2)$ B. $(2x+3y)(4x^2 - 12xy + 9y^2)$
C. $(2x+3y)(4x^2 - 6xy + 9y^2)$ D. $(2x+3y)(4x^2 + 6xy + 9y^2)$
3. Let a be a constant. Solve the equation $(x-a)(x-a-1) = x-a$.
A. $x = a+1$ B. $x = a+2$
C. $x = a$ or $x = a+1$ D. $x = a$ or $x = a+2$
4. Let k be the smaller number of two consecutive positive even numbers. If the sum of the squares of the two even numbers is more than the product of the two even numbers by 84 , find the value of k .
A. 4 B. 8 C. 10 D. 16
5. If a and b are real numbers such that $ab > 0$, which of the following must be true?
I. $\frac{a}{b} > 0$ II. $a+b > 0$ III. $a^2 + b^2 > 0$
A. I and II only B. I and III only C. II and III only D. I , II and III

Question	1	2	3	4	5
Answer					

6. Which of the following values satisfies the inequality $5x - 7 - 3x < 11 - 4x$?
 A. 2 B. 3 C. 4 D. 5
7. The width and the length of a rectangle are 6 cm and 8 cm respectively. If its perimeter is not greater than 25 % of the perimeter of a square, find the least length of a side of the square.
 A. 6 cm B. 7 cm C. 8 cm D. 28 cm
8. A number is first increased by 10 % and then decreased by 20 % . Find the overall percentage change of the number.
 A. -12 % B. -10 % C. 8 % D. 10 %
9. A sum of \$ P is deposited at a bank at an interest rate of r % p.a., compounded quarterly. The interest earned in n years is
 A. $\$ [P(1+r\%)^n - P]$. B. $\$ P \left[\left(1 + \frac{r}{4}\% \right)^{4n} - 1 \right]$.
 C. $\$ P (r\%)^n$. D. $\$ P \left(1 + \frac{r}{4}\% \right)^{4n}$.
10. The monthly rental income of a flat is \$ 15000 . If the property tax rate is 15 % , find the property tax payable by the owner of the flat.
 A. \$ 270 B. \$ 2250 C. \$ 21600 D. \$ 27000

Question	6	7	8	9	10
Answer					

Section B Conventional Questions (30 marks)

11. Factorize the following expressions.
 (a) $-18x - 18x^2 + 8$
 (b) $2x^2 + 13xy + 15y^2$ (3 marks)

Section A Multiple Choice Questions (20 marks)

Question	1	2	3	4	5	6	7	8	9	10
Answer	D	C	D	B	B	A	D	A	B	C

Section B Conventional Questions (30 marks)

Solution	Marks	Remarks
11. (a) $-18x - 18x^2 + 8$ $= -18x^2 - 18x + 8$ $= -2(9x^2 + 9x - 4)$ $= -2(3x + 4)(3x - 1)$ (b) $2x^2 + 13xy + 15y^2$ $= (2x + 3y)(x + 5y)$	1M 1A 1A -----(3)	for taking out the common factor or equivalent
12. (a) $8x^3 - 1$ $= (2x - 1)(4x^2 + 2x + 1)$ (b) $8x^3 + 6x - 4$ $= 8x^3 - 1 + 6x - 4 + 1$ $= (2x - 1)(4x^2 + 2x + 1) + 3(2x - 1)$ $= (2x - 1)(4x^2 + 2x + 1 + 3)$ $= 2(2x - 1)(2x^2 + x + 2)$	1A 1M 1M 1A -----(4)	for using the result of (a)
13. (a) $3x^2 - 8x + 4 = 0$ $(3x - 2)(x - 2) = 0$ $3x - 2 = 0$ or $x - 2 = 0$ $x = \frac{2}{3}$ or $x = 2$ (b) $(2x - 1)(3x + 1) = 4x - 2$ $(2x - 1)(3x + 1) - (4x - 2) = 0$ $(2x - 1)(3x + 1) - 2(2x - 1) = 0$ $(2x - 1)(3x + 1 - 2) = 0$ $(2x - 1)(3x - 1) = 0$ $2x - 1 = 0$ or $3x - 1 = 0$ $x = \frac{1}{2}$ or $x = \frac{1}{3}$	1M 1A 1M 1A -----(4)	

