

PMATH 12 - CHAPTER 1 - PRETEST parent/guardian signature

Multiple Choice - PART 1 - NON-CALCULATOR - 10 MINUTES (#1-5)

Circle the choice that best completes the statement or answers the question.

1. Divide: $(-4x^2 + 22x + 12) \div (x - 6)$

- A. $4x + 6$
- B. $4x - 48$
- C. $-4x + 12$
- D. $-4x - 2$

2. What is the remainder when $x^3 + 4 - 11x + 3x^2$ is divided by $6 + x$?

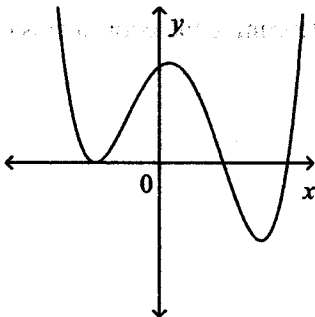
- A. 70
- B. -62
- C. -38
- D. 46

3. For the polynomial $P(x) = -3x^2 - 4x - 5$, what is the value of $P(-2)$?

- A. -25
- B. 15
- C. -21
- D. -9

4. The graph of a polynomial function of degree 4 is shown. Which statements are true?

- i) The function has an even degree.
- ii) The function has a zero of multiplicity 2.
- iii) The equation of the function has a negative leading coefficient.
- iv) The y-intercept is positive.



- A. i, ii, iii
- B. i, iii, iv
- C. ii, iii, iv
- D. i, ii, iv

5. Determine the zeros of the polynomial function $f(x) = (x + 2)^4(x - 5)$. State the multiplicity of each zero.

- A. The zero 4 has multiplicity 2; the zero 1 has multiplicity -5.
- B. The zero 4 has multiplicity -2; the zero 1 has multiplicity 5.
- C. The zero -2 has multiplicity 4; the zero 5 has multiplicity 1.
- D. The zero 2 has multiplicity 4; the zero -5 has multiplicity 1.

MULTIPLE CHOICE - PART 2 - CALCULATOR may be used after 10 minutes

6. Divide $-3x^3 - 2x^2 + 4x + 3$ by $x + 3$. Write the division statement.
- A. $-3x^3 - 2x^2 + 4x + 3 = (x + 3)(-3x^2 - 11x + 25)$
 - B. $-3x^3 - 2x^2 + 4x + 3 = (x + 3)(-3x^2 - 11x + 25) - 48$
 - C. $-3x^3 - 2x^2 + 4x + 3 = (x + 3)(-3x^2 + 7x - 17)$
 - D. $-3x^3 - 2x^2 + 4x + 3 = (x + 3)(-3x^2 + 7x - 17) + 54$
7. Which two binomials are factors of $x^4 + 8x^3 + 7x^2 - 40x - 60$?
- A. $x + 2$ and $x - 6$
 - B. $x - 2$ and $x - 6$
 - C. $x - 2$ and $x + 6$
 - D. $x + 2$ and $x + 6$
8. Use graphing technology. Graph the polynomial function $f(x) = x^3 - 7x^2 + 11x - 5$. Which characteristics apply to the graph?
- A. Number of x -intercepts: 3
Number of hills: 1
Number of valleys: 1
 - B. Number of x -intercepts: 2
Number of hills: 2
Number of valleys: 1
 - C. Number of x -intercepts: 2
Number of hills: 1
Number of valleys: 1
 - D. Number of x -intercepts: 1
Number of hills: 1
Number of valleys: 2
9. Use a graphing calculator to graph the function $V(x) = x^3 - 7x^2 + 10x$. Determine the coordinates of the local maximum point to the nearest tenth.
- A. (0.9, 8.2)
 - B. (3.8, 4.1)
 - C. (3.8, 8.2)
 - D. (0.9, 4.1)

SHOW YOUR WORK SECTIONS

1. Divide: $(-5x^5 - 20x^4 - 25x^3 - 12x^2 - 5x + 40) \div (x + 2)$
Write the quotient and the remainder.

2. Write an equation in standard form for a cubic function with zeros 1, -2, and 4.

PROBLEM

1. A polynomial is divided by $x + 2$. The quotient is $5x^2 + 5x + 9$ and the remainder is 3. What is the original polynomial? Explain your work.

2. Is $3x - 1$ a factor of $3x^3 - x^2 - 15x + 10$? Justify your answer.

3. Use graphing technology. Complete the table below for the graphs.

i) $f(x) = -x^4 + x^3 + 3x^2 - x - 2$

ii) $g(x) = -x^4 - 3x^3 - 2x^2 + 3x + 3$

iii) $h(x) = x^4 - x^3 - x^2 + 4x + 3$

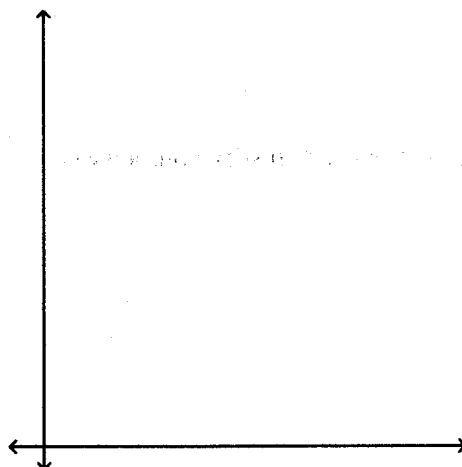
iv) $j(x) = x^4 + 3x^3 - 2x^2 - 3x + 1$

Graph	Number of x-intercepts	Number of hills	Number of valleys	y-intercept
i				
ii				
iii				
iv				

4. The volume, in cubic centimetres, of an expandable box can be represented by the polynomial function $V(x) = x^3 - 43x^2 + 432x$. The width of the box in centimetres is $16 - x$. Assume the length is greater than the width.

a) Determine the expressions for the height and width of the box in terms of x .

b) Graph the function. Sketch the graph. What do the x-intercepts represent?



c) To the nearest cubic centimetre, what is the approx. maximum volume of the box?