PMATH 12 - CHAPTER 1 - PRETEST   parent/guardian signature

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

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

   a. $4x - 48$ c. $4x + 6$
   b. $-4x - 2$ d. $-4x + 12$

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

   a. -38 c. -62
   b. 46 d. 70

3. 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. $-3x^3 - 2x^2 + 4x + 3 = (x + 3)(-3x^2 + 7x - 17) + 54$
   d. $-3x^3 - 2x^2 + 4x + 3 = (x + 3)(-3x^2 + 7x - 17)$

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

   a. -9 c. -25
   b. -21 d. 15

5. Which two binomials are factors of $x^4 + 8x^3 + 7x^2 - 40x - 60$?

   a. $x + 2$ and $x - 6$ c. $x + 2$ and $x + 6$
   b. $x - 2$ and $x - 6$ d. $x - 2$ and $x + 6$

6. Use graphing technology. Graph the polynomial function $f(x) = x^3 - 5x^2 + 7x - 3$.
   Which characteristics apply to the graph?

   a. Number of x-intercepts: 3   c. Number of x-intercepts: 2
       Number of hills: 1   Number of hills: 2
       Number of valleys: 1   Number of valleys: 1
   b. Number of x-intercepts: 1   d. Number of x-intercepts: 2
       Number of hills: 1   Number of hills: 1
       Number of valleys: 2   Number of valleys: 1

7. 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.
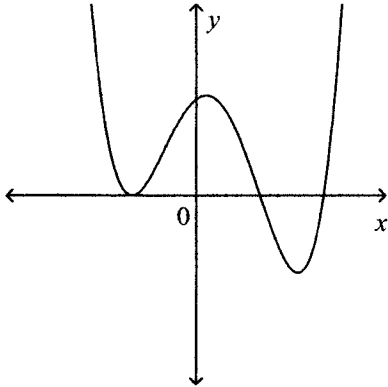
   a. i, ii, iii   b. i, ii, iv   c. ii, iii, iv   d. i, iii, iv

8. 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 2 has multiplicity 4; the zero –5 has multiplicity 1.
   c. The zero –2 has multiplicity 4; the zero 5 has multiplicity 1.
   d. The zero 4 has multiplicity –2; the zero 1 has multiplicity 5.

9. Use graphing technology to graph the function $V(x) = x^3 - 7x^2 + 10x$. Determine the coordinates of the local maximum point to the nearest tenth.

   a. (3.8, 4.1)   b. (3.8, 8.2)   c. (0.9, 4.1)   d. (0.9, 8.2)

Short Answer - SHOW YOUR WORK

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

    $Q =$

    $R =$

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

Problem - SHOW YOUR WORK

12. 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.

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

14. a) Use graphing technology. Complete the table below for the graphs of,
   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				

15. 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 binomial 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?
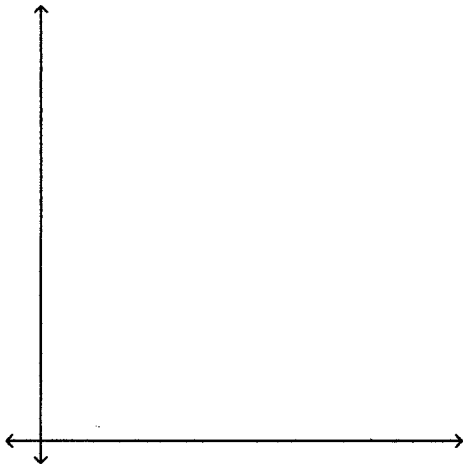
   c) To the nearest cubic centimetre, what is the **approximate** maximum volume of the box?