Name: _____ Date: _____

Chapter 2 Test

BLM 2–11

For questions 1 to 3, select the best answer.

1. Which of the following is not a factor of $2x^3 - x^2 - 18x + 9$?
A $x + 3$
B $x - 3$
C $2x + 1$
D $2x - 1$

2. Which statement is false for $P(x) = -2x^3 + 11x^2 - 19x + 10$?
A $P(x) = (x + 1)(-2x^2 + 13x - 32) + 42$
B $2x - 5$ is a factor of $P(x)$.
C When $P(x)$ is divided by $x - 2$, the remainder is 10.
D $x - 2$ is a factor of $P(x)$.

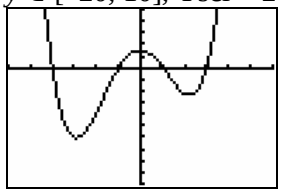
3. The values that could be zeros for the polynomial $x^3 - 2x^2 - 19x + 20$ are
A $\pm 1, \pm 4, \pm 5$
B $\pm 1, \pm 2, \pm 4, \pm 5, \pm 10, \pm 20$
C $\pm 1, \pm 2, \pm 4, \pm 5$
D $\pm 1, \pm 2, \pm 4, \pm 5, \pm 10$

4. **a)** Divide $3x^3 - x^2 - 1$ by $x + 2$. Express the result in quotient form.
b) Identify any restrictions on the variable.
c) Write the corresponding statement that can be used to check the division.

5. **a)** Determine the value of k such that when $P(x) = x^4 - 2x^2 + kx - 4$ is divided by $x + 3$, the remainder is 2.
b) Determine the remainder when $P(x)$ is divided by $2x - 1$.
c) Verify your answer in part b) using long division.

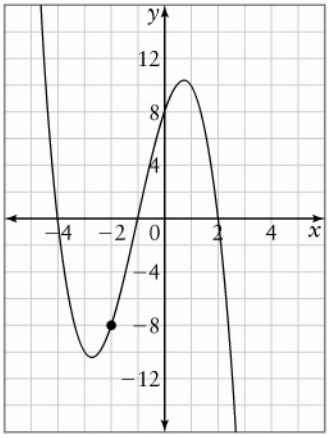
6. Factor.
a) $x^3 - 125y^3$
b) $x^3 - 4x^2 - 9x + 36$
c) $x^3 + 4x^2 + x - 6$
d) $3x^3 + 8x^2 + 3x - 2$
e) $x^4 - 4x^3 - x^2 + 16x - 12$

7. Use the graph to determine the roots of the corresponding polynomial equation. Window variables: $x \in [-6, 6]$, $y \in [-20, 10]$, Yscl = 2



8. Solve by factoring.
a) $2x^3 - x^2 - 6x = 0$
b) $x^3 - 2x^2 - 5x + 6 = 0$
c) $2x^4 + 3x^3 - 7x^2 - 12x - 4 = 0$

9. Determine an equation for the cubic function represented by this graph.



10. Determine an equation, in simplified form, for the family of quartic functions with zeros $1 \pm \sqrt{3}$ and $2 \pm \sqrt{5}$.

11. Use Technology Solve. Round answers to one decimal place.
a) $3x^3 - 6x^2 + x - 6 \geq 0$
b) $2x^4 - x^2 - 2 < 5x - 3x^3$

12. Solve by factoring.
a) $4x^2 - 64 \geq 0$
b) $-x^3 + 2x^2 + 8x < 0$
c) $x^4 - 3x^3 - 3x^2 + 7x + 6 > 0$

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13. An open-top box is to be constructed from a rectangular piece of cardboard measuring 52 cm by 36 cm. The box is created by cutting congruent corners and then folding up the sides.

a) Express the volume of the box as a function of x.

b) Use your function from part a) to determine the value(s) of x, to two decimal places, that will result in a volume that is greater than 3024 cm^3.

c) Determine the dimensions of the box for the volume given in part b).