

A.APR.1**SELECTED RESPONSE**

Select the correct answer.

1. Which of the following best describes the sum of $ax^2 + bx + c$ and $mx^2 + nx + p$, where x is a variable and a, b, c, m, n , and p are real numbers.
- (A) The sum is a constant.
- (B) The sum is an exponential expression.
- (C) The sum is a polynomial.
- (D) Nothing can be determined about the sum without more information.
2. If $2x^2 - 5x + 7$ is subtracted from $4x^2 + 2x - 11$, what is the coefficient of x in the result?
- (A) 2
- (B) 7
- (C) -3
- (D) -18

3. What is the resulting polynomial when $3x + 7$ is multiplied by $2x - 6$?

- (A) $5x + 1$
- (B) $6x - 42$
- (C) $6x^2 - 4x - 42$
- (D) $6x^2 + 9x - 42$

Select all correct answers.

4. Simplify each of the following expressions to determine which are linear.

- (A) $(x^2 + 6x + 9) + (x^2 - 4x + 4)$
- (B) $2(2x^2 + x - 10) - (5x^2 - 3x + 1)$
- (C) $4(3x^2 + 5x - 4) - 6(2x^2 + 2x - 1)$
- (D) $3(x^2 - x + 1) + (-2x^2 + 4x - 5)$
- (E) $4(2x^2 - 6x + 7) - 8(x^2 - 3x + 4)$

Select the correct answer for each lettered part.

5. Simplify each expression. Does the x in the result have a positive coefficient?

- a. $(5x + 10) + (x - 100)$ Yes No
- b. $\left(\frac{11}{4}x - 2\right) - \left(8x - \frac{13}{2}\right)$ Yes No
- c. $(4x - 3.2)(x + 0.5)$ Yes No
- d. $(-3x + 4\sqrt{5}) - (-2x - \sqrt{13})$ Yes No
- e. $(-1.7x - 4.2) + \left(\frac{20x}{7} - \sqrt{7}\right)$ Yes No

CONSTRUCTED RESPONSE

6. Write $(2x + 1)(3x - 8)$ in expanded form.

7. Will the simplified form of the sum of two quadratic polynomials with x^2 terms always have an x^2 term? Explain.

8. Wanda manages a webstore that specializes in kitchenware. The store sells a tea set for \$65, and it averages 30 sales of this tea set per month. Based on past sales, Wanda estimates that for every \$5 price increase for this tea set, she will sell 2 fewer sets each month. Write an expression for Wanda's monthly gross revenue from tea set sales after x \$5 price increases as the product of two factors and then rewrite the expression in expanded form. Show your work.

9. Two cars are driving along a straight highway at a constant speed. At a certain point in time, one car is 1.2 miles away from a landmark and is driving at 65 miles per hour, and the other car is 0.7 miles away from the same landmark and is driving at 55 miles per hour.

a. Write an expression for the distance between the first car and the landmark in terms of the number of hours spent driving t if the car is driving away from it.

b. Write an expression for the distance between the second car and the landmark in terms of the number of hours spent driving t if the car is driving away from it.

c. Use your answers to parts a and b to write an expression for the distance between the two cars in terms of the number of hours spent driving t if the cars are on the same side of the landmark and driving in the same direction away from the landmark. Show your work.

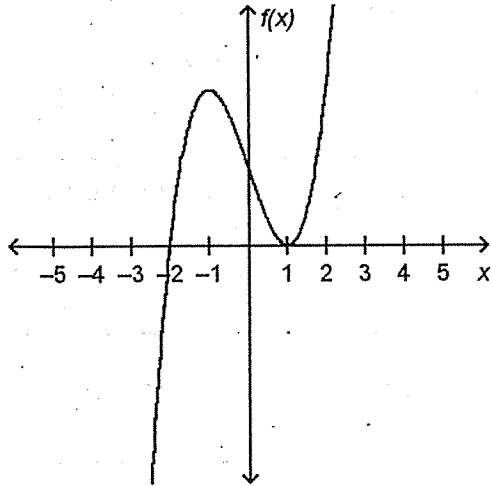
d. Use your answers to parts a and b to write an expression for the distance between the two cars in terms of the number of hours spent driving t if the cars are on opposite sides of the landmark and driving in opposite directions away from the landmark. Show your work.

A.APR.3

SELECTED RESPONSE

Select the correct answer.

1. Which of the following polynomial functions could have the graph shown?



- (A) $f(x) = (x - 2)(x + 1)$
 - (B) $f(x) = (x - 2)(x + 1)(x + 1)$
 - (C) $f(x) = (x + 2)(x - 1)$
 - (D) $f(x) = (x + 2)(x - 1)(x - 1)$
2. Which of the following statements about the graph of $f(x) = (x - 6)(x^2 - 3x - 18)$ is true?
- (A) It passes through the x -axis once and is never tangent to the x -axis.
 - (B) It passes through the x -axis once and is tangent to the x -axis once.
 - (C) It passes through the x -axis twice and is tangent to the x -axis once.
 - (D) It passes through the x -axis three times and is never tangent to the x -axis.

Select all correct answers.

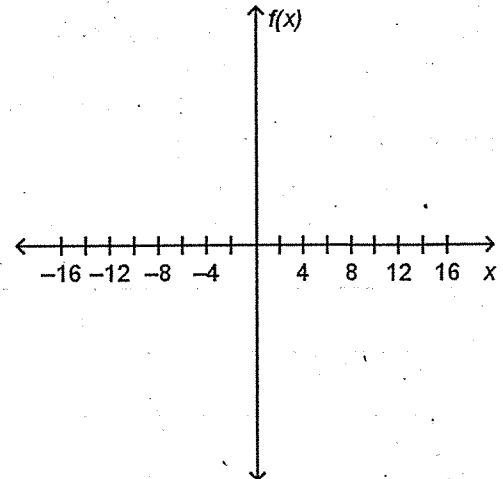
3. Which of the following polynomial functions have graphs that intersect the horizontal axis at least twice?

- (A) $f(x) = x^2 + 10x + 9$
- (B) $f(x) = x^2 - 10x + 25$
- (C) $f(x) = x^2 - 81$
- (D) $f(x) = (x - 1)(x^2 + 9x + 20)$
- (E) $f(x) = (x - 4)(x^2 - 8x + 16)$
- (F) $f(x) = (x + 2)(x^2 - 4x + 4)$

CONSTRUCTED RESPONSE

4. Let $f(x) = -(x + 3)(x - 4)$.
- a. Identify the zeros of the function.

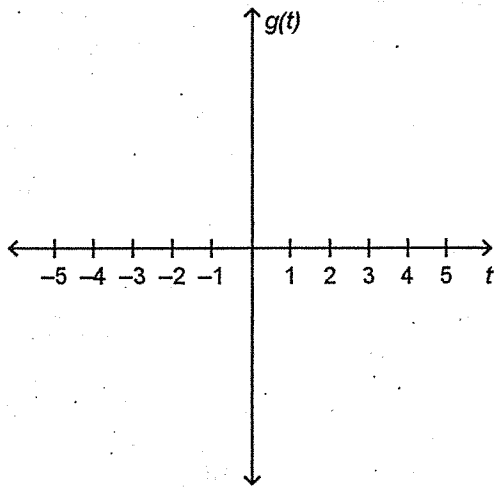
- b. Sketch a graph of the function.



5. Let $g(t) = (t + 2)(t^2 - 5t + 4)$.

- a. Identify the zeros of the function.
Show your work.

- b. Sketch a graph of the function.



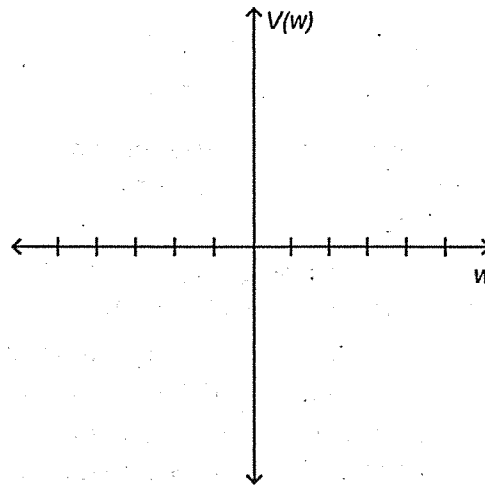
6. What is the minimum number of times the graph of $f(x) = a(x + b)(x + c)(x + d)$ must intersect the x -axis if a , b , c , and d are real numbers and $a \neq 0$? Explain.

7. The width of a rectangular prism is three units longer than its length and four units shorter than its height.

- a. Write a polynomial function for the volume of the rectangular prism $V(w)$ in terms of the width of the rectangular prism w .

- b. Identify the zeros of the function.

- c. Sketch a graph of the function.



- d. Which part of the graph could not represent a real prism? Explain.
