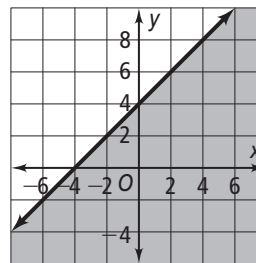# Chapter 9 Cumulative Review

Multiple Choice

For Exercises 1–8, choose the correct letter.

1. What is the y-intercept of $y = 0.75(3)^x$?

   Ⓐ $(0, 0.75)$ Ⓑ $(0, 2.25)$ Ⓒ $(3, 0)$ Ⓓ $(4, 0)$

2. What is $\dfrac{x^2 + 8x + 15}{x^2 - x - 12}$ in simplest form?

   Ⓕ $\dfrac{x + 5}{x + 3}$ Ⓖ $\dfrac{x + 5}{x - 4}$ Ⓗ $\dfrac{x + 5}{x + 4}$ Ⓘ $\dfrac{(x + 5)(x + 3)}{(x - 4)(x + 3)}$

3. Which expression is equivalent to $\dfrac{\sqrt[3]{x^2}}{\sqrt[6]{x^2}}$?

   Ⓐ $\sqrt[2]{x}$ Ⓑ $\sqrt[2]{x^{-3}}$ Ⓒ $\sqrt[3]{x}$ Ⓓ $\sqrt[3]{x^2}$

4. How is the polynomial $2x^2 - x^3 + 4x + 17$ classified by degree?

   Ⓕ linear   Ⓖ quadratic   Ⓗ cubic   Ⓘ quartic

5. The discriminant of a quadratic equation has a value of 0. Which of the following is true?

   Ⓐ There is one real solution.   Ⓒ There is one complex solution.

   Ⓑ There are no real solutions.   Ⓓ There are two complex solutions.

6. Which of these does not have the same value as the others?

   Ⓕ $\log_2 8$ Ⓖ $\log_3 9$ Ⓗ $\log_4 64$ Ⓘ $\log_5 125$

7. Which inequality is graphed?

   Ⓐ $y \leq x + 4$ Ⓒ $y \geq x + 4$

   Ⓑ $y \leq x - 4$ Ⓓ $y < x + 4$

8. If $f(x) = 4x + 1$ and $g(x) = 2x^2$, what is the value of $g(f(-8))$?

   Ⓕ 1922   Ⓖ 513   Ⓗ 257   Ⓘ -127

Chapter 9 Cumulative Review (continued)

Short Response

9. Graph the system of inequalities $\begin{cases} y < 2x - 1 \\ y \geq -x + 3 \end{cases}$.

10. Describe how the graph of $y = \log_3(x - 2) + 5$ compares to the graph of the parent function.

11. How can the relationship between variables in the table be described?

x	y
1	20
2	10
4	5
5	4

12. Use the sequence 100, 95, 90, 85, . . .
   a. Describe the sequence in words.
   b. Find the next three terms.

13. Water leaks from a 10,000-gal tank at a rate of 5 gal/h. Write a linear model for the situation and use it to find the amount of water in the tank after 24 h.

Extended Response

14. You have a coupon for $10 off a CD. You also get a 20% discount if you show your membership card in the CD club. How much more would you pay if the cashier applies the coupon first? Use composite functions. Show your work.