Algebra I Unit 2: Radicals, Exponents, and Expressions

1. What are the factors of the expression $2x^2 + 5x - 3$?

(A) $(2x - 1)$ and $(x + 3)$
(B) $(x - 1)$ and $(2x + 3)$
(C) $(2x + 1)$ and $(x - 3)$
(D) $(x + 1)$ and $(2x - 3)$

2. Which expression is equivalent to $2 + 3(x - 5)(x - 5)$?

(A) $5(x - 5)(x - 5)$
(B) $2 + 3(x - 5)^2$
(C) $2 + 3(x + 5)^2$
(D) $6(x - 5)^2$

3. Choose an equivalent form of the equation $y = x^2 + 4x + 3$ and identify what feature of the graph this new form identifies.

(A) $y = (x + 3)(x + 1)$; vertex at $(-3\,,\ -1)$
(B) $y = (x - 3)(x - 1)$; vertex at $(3, 1)$
(C) $y = (x + 3)(x + 1)$; x-intercepts at $(-3, 0)$ and $(-1, 0)$
(D) $y = (x - 3)(x - 1)$; x-intercepts at $(3, 0)$ and $(1, 0)$

4. What is the linear term in the quadratic equation $y = x^2 - 7x + 6$?

(A) x^2
(B) $7x$
(C) $-7x$
(D) 6

5. What is the degree of the polynomial $9x^2y^2 - 7x^2y^3 + 6x^2y - 3y^2$?

(A) 9
(B) 5
(C) 4
(D) 2

6. Which of the following expressions is **not** equivalent to $\frac{2^{4x}}{2^x}$?

(A) 2^{3x}
(B) 8^x
(C) $64^{\frac{1}{2}x}$
(D) 2^4

7. In the compound interest expression $250(1.15)^t$, what's the annual interest rate?

(A) 0.15%
(B) 1.15%
(C) 15%
(D) 115%

8. Which expression is equivalent to $\sqrt[3]{z^{\frac{1}{2}}}$?

(A) $z^{\frac{3}{2}}$
(B) $z^{\frac{1}{6}}$
(C) z^6
(D) $\sqrt[\frac{3}{2}]{z}$

9. Farmer Shmoop has a roll of fencing material with a fixed length to make the border of a rectangular horse corral. After setting up the fence with length l and width w, he realizes the corral needs to be longer. The corral improvement store is closed, so he needs to use the amount of fence he already has. If he uses the same roll of fence as before, what will happen to the width w of the corral if he increases the length l and keeps it in a rectangular shape?

(A) The width w will get shorter.
(B) The width w will get longer.
(C) The width w will stay the same.
(D) There is no way to tell what will happen to w.

10. Which expression is equivalent to $\left(\frac{1}{2}\right)^{-3}$?

(A) $\frac{1}{8}$
(B) $\frac{1}{6}$
(C) $-\frac{1}{8}$
(D) 8

11. Which expression is best described by "seven less than four times the product of a number x and a number y"?

(A) $7 - 4xy$
(B) $4xy - 7$
(C) $(4x - 7)y$
(D) $4x - 7y - 7$

12. Which of the following equations represents an exponential decay rate of 0.2?

(A) $y = 2(0.8)^x$
(B) $y = 2(1.2)^x$
(C) $y = 2(0.2)^x$
(D) $y = 0.2(1.2)^x$

13. What prevents the expression $-\frac{2}{x} + 8^{-1}x$ from being linear?

(A) The negative sign in front of the $\frac{2}{x}$ prevents it from being linear.
(B) The 8^{-1} prevents the expression from being linear.
(C) It's not linear because of the x term.
(D) The $-\frac{2}{x}$ term is why the expression isn't linear.

14. Which linear expression is equivalent to $-3x + 12$?

(A) $-3(x + 12)$
(B) $-3(x + 4)$
(C) $-3(x - 12)$
(D) $-3(x - 4)$

15. Evaluate $(8x^3)^{\frac{1}{3}}$.

(A) $2x$
(B) $\frac{8}{3}x$
(C) $8x$
(D) $2x^3$

16. Which of the following is **not** equivalent to $a^{\frac{b}{c}}$?

(A) $\sqrt[c]{a^b}$
(B) $\left(\sqrt[c]{a}\right)^b$
(C) $\sqrt[b]{a^c}$
(D) $\frac{1}{a^{-\frac{b}{c}}}$

17. Since $\sqrt{2} \times \sqrt{2} = 2$, what can we say about $\sqrt{2}$?

(A) $\sqrt{2} = 2^{\frac{1}{2}}$
(B) $\sqrt{2} = 2^2$
(C) $\sqrt{2} = 1^2$
(D) $\sqrt{2} = 2^1$