

1. Given that  $x < 0$  and  $y > 0$ , which of the following values must be negative?

- A.  $x^2y$
- B.  $x^2 + y$
- C.  $\frac{y-x}{x}$
- D.  $y^2 - x$
- E. None of the above

2. Simplify. Do not leave negative exponents in your answer.

$$\frac{6x^{-5}y^4z^{-3}}{18x^{-9}y^{-2}z}$$

- A.  $\frac{x^4y^6}{3z^4}$
- B.  $\frac{y^2}{3x^{14}z^4}$
- C.  $\frac{y^6z^2}{3x^4}$
- D.  $\frac{x^{14}z^4}{3y^2}$
- E. None of the above

3. Simplify.

$$\left(8x^{\frac{5}{6}}\right)^{\frac{2}{3}}\left(x^{\frac{2}{9}}\right)$$

- A.  $\frac{16}{3}x^{\frac{10}{9}}$
- B.  $4x^{\frac{7}{9}}$
- C.  $\frac{16}{3}x^{\frac{7}{9}}$
- D.  $4x^{\frac{10}{9}}$
- E. None of the above

4. Rationalize the denominator and simplify the result.

$$\frac{x^2 - 16}{\sqrt{x} - 2}$$

A.  $(x - 4)(\sqrt{x} + 2)$

B.  $x - 8$

C.  $(x - 4)(\sqrt{x} - 2)$

D.  $\frac{(x + 4)(x - 4)(\sqrt{x} - 2)}{x - 2}$

E.  $(x + 4)(\sqrt{x} + 2)$

5. Multiply and express as a polynomial.

$$(x)(3x - 4)^2$$

A.  $9x^4 + 16x^2$

B.  $9x^4 - 24x^3 + 16x^2$

C.  $9x^3 - 16x$

D.  $9x^3 - 24x^2 + 16x$

E. None of the above

6. Perform the indicated operations and express as a polynomial.

$$(2x^3 - 4x + 1) + 3(x^3 - 2x^2 + 3x - 5)$$

A.  $5x^3 - 2x^2 - x - 4$

B.  $5x^3 - 10x^2 + 9x - 14$

C.  $5x^3 + 6x^2 - 13x + 16$

D.  $5x^3 - 6x^2 + 5x - 14$

E. None of the above

7. Which of the following is a factor of  $4x^6 - 7x^3 - 15$ ?

A.  $4x^3 + 5$

B.  $2x^3 - 3$

C.  $x^3 - 5$

D.  $4x^3 + 3$

E. None of the above are factors

8. Simplify.

$$\frac{2x^2 + 7x - 15}{(x + 2)^2} \cdot \frac{x^4 - 16}{2x^2 - 7x + 6}$$

- A.  $(x + 5)(x + 4)$
- B.  $-\frac{5(x + 2)^2}{2}$
- C.  $\frac{(x + 5)(x^2 + 4)}{x + 2}$
- D.  $(x + 5)(x - 2)$
- E. None of the above

9. Perform the indicated operations and simplify.

$$\frac{5t}{t^2 - 16} - \frac{t}{t + 4}$$

- A.  $\frac{9t - t^2}{(t + 4)(t - 4)}$
- B.  $4t$
- C.  $\frac{4t}{(t + 4)(t - 4)}$
- D.  $9t - t^2$
- E. None of the above

10. Simplify.

$$\frac{\frac{b}{a} + \frac{a}{b}}{\frac{1}{b}}$$

- A.  $b$
- B.  $\frac{b + a}{a}$
- C.  $1 + a$
- D.  $\frac{b^2 + a^2}{a}$
- E. None of the above

11. Solve the following equation for  $x$ . Choose the answer that best describes the solution.

$$\frac{3x - 4}{24} = 1 + \frac{x}{4}$$

- A.  $x$  is between  $-13$  and  $-10$
- B.  $x$  is between  $-10$  and  $-9$
- C.  $x$  is between  $-2$  and  $-1$
- D.  $x$  is between  $-1$  and  $3$
- E. There is no solution for  $x$

12. For what value of  $c$  is the number  $x = 5$  a solution of the following equation?

$$2x - 7 + 5c = 3c - 4x - 9$$

- A.  $c = -\frac{1}{10}$
- B.  $c = -16$
- C.  $c = -2$
- D.  $c = -\frac{13}{4}$
- E. None of the above

13. Two hundred and fifty people attended a school play. Student tickets cost \$2 and nonstudent tickets cost \$3. The total amount of money collected was \$700. If  $x$  represents the number of student tickets sold, find the equation that would be used to solve for  $x$ . Do not solve the equation.

- A.  $2x - 700 = 3x - 250$
- B.  $2x + 3(700 - x) = 250$
- C.  $700(2x + 3x) = 250$
- D.  $2x + 3x = 700$
- E.  $2x + 3(250 - x) = 700$

14. Two people, who are 175 meters apart, start walking toward each other at the same time at constant rates of 1.7 m/sec. and 2.2 m/sec., respectively. After how many seconds will they meet? Round your answer to the nearest second.

- A. 45 seconds
- B. 47 seconds
- C. 62 seconds
- D. 99 seconds
- E. None of the above

15. A couple went to a restaurant for dinner. A sales tax of 6% was added to their bill and they tipped the waiter 20% after the sales tax had been added. The couple ended up paying a total of \$66.20. If  $x$  represents the amount of the pre-tax bill, find the equation that would be used to solve for  $x$ . Simplify the equation but do not solve.

- A.  $.26x = 66.20$
- B.  $1.272x = 66.20$
- C.  $1.072x = 66.20$
- D.  $1.26x = 66.20$
- E.  $.072x = 66.20$