

1. If $x > 0$ and $y < 0$, which of the following would produce a positive result?

I.	x^2y
II.	$\frac{xy^2}{x-y}$
III.	$\frac{y-x}{x}$

- A. II only
- B. III only
- C. I and III only
- D. I, II, and III
- E. None are positive.

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

$$\left(\frac{8x^2y^7}{x^{-5}y^4}\right)\left(\frac{x^4y^{-9}}{32}\right)$$

- A. $\frac{x^6}{4y^6}$
- B. $4x^6y^6$
- C. $4x^{11}y^6$
- D. $\frac{x^{11}}{4y^6}$
- E. None of the above.

3. Simplify.

$$(27a)^{\frac{1}{3}}\left(4a^{\frac{1}{4}}\right)$$

- A. $36a^{\frac{7}{12}}$
- B. $36a^{\frac{2}{7}}$
- C. $12a^{\frac{7}{12}}$
- D. $6a^{\frac{1}{12}}$
- E. $12a^{\frac{2}{7}}$

4. Simplify.

$$\left(\sqrt{8x^5y^3}\right)\left(\sqrt{3x^6y^5}\right)$$

A. $2x^5y^4(\sqrt{6x})$

B. $12x^{15}y^7(\sqrt{y})$

C. $12x^5y^4(\sqrt{6x})$

D. $2x^{15}y^7(\sqrt{3y})$

E. Cannot be determined

5. Rationalize the denominator and simplify.

$$\frac{\sqrt{x}-3}{\sqrt{x}+3}$$

A. $\frac{x-9}{x+9}$

B. $\frac{x-6\sqrt{x}+9}{x-9}$

C. $\frac{x-3\sqrt{x}+9}{x-9}$

D. $\frac{x-3}{x+3}$

E. $\frac{x-6\sqrt{x}+9}{x-3}$

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

$$(4x+3)(2x-1)-(5x^2-4x+8)$$

A. $3x^2+6x-11$

B. $3x^2-2x+5$

C. $3x^2+4x-11$

D. $3x^2-4x+5$

E. None of the above.

7. Which of the following is a factor of $12x^2 - 23x + 10$?

- A. $3x + 2$
- B. $4x + 5$
- C. $6x - 5$
- D. $3x - 2$
- E. $2x - 5$

8. Factor completely. Given: $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$

$$27x^6 - y^{12}$$

- A. $27(x - y^2)^6$
- B. $(3x^3 + y^4)(3x^3 - y^4)$
- C. $(3x^2 - y^4)(9x^4 + 3x^2y^4 + y^8)$
- D. $(3x^2 - y^4)(3x^2 + 3x^2y^4 + y^4)$
- E. $(9x - y^3)(9x^2 + 6x^4y^4 + y^8)$

9. Divide and simplify.

$$\frac{9x^2 - 1}{3x^2 + 7x + 2} \div \frac{6x^2 + 7x - 3}{(x + 2)^2}$$

- A. $\frac{(3x - 1)(x + 2)}{(3x + 1)(2x + 3)}$
- B. $\frac{2x - 3}{x + 2}$
- C. $\frac{(2x + 3)(x + 2)}{3x + 1}$
- D. $\frac{3x - 1}{2x + 3}$
- E. $\frac{x + 2}{2x + 3}$

10. Simplify.

$$\frac{\frac{1}{x-2} + 1}{x - \frac{1}{x}}$$

A. $\frac{1}{(x-2)(x-1)}$

B. $\frac{x}{(x-2)(x+1)}$

C. $\frac{x}{x-2}$

D. $\frac{1}{x+1}$

E. $\frac{2x}{(x-2)(x-1)}$

11. Solve for x . Choose the answer that best describes the solution(s).

$$\frac{2x}{x-1} = 3 + \frac{2}{x-1}$$

A. x is less than 2.

B. x is between 2 and 5.

C. x is greater than 5.

D. There is no solution for x .

E. All real x are solutions except $x = 1$.

12. Solve $MK + P = T - LK$ for K .

A. $K = \frac{T - P}{M + L}$

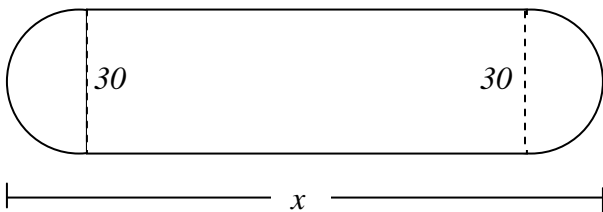
B. $K = \frac{T - P}{2ML}$

C. $K = \frac{TL}{PM}$

D. $K = \frac{TP}{M + L}$

E. Equation cannot be solved for K .

13. A lawyer bills \$175 per hour. Her assistant bills \$45 per hour. A client received a bill for \$750. The assistant worked 3 hours less than twice as long as the lawyer. If x represents the number of hours the lawyer worked on the job, choose the equation that would be used to solve for x .
- A. $175(3x - 2) + 45x = 750$
 B. $175x + 45(2x - 3) = 750$
 C. $175x + 45x = 750$
 D. $175x + 45(3x - 2) = 750$
 E. $175(2x - 3) + 45x = 750$
14. The Purdue Special train is driving to a city that is hosting a Purdue sporting event. The Special leaves campus at 10:00 AM and is traveling at a constant rate of 40 miles per hour. A car full of fans leaves campus at 11:30 AM and travels the same route at a constant rate of 70 miles per hour. At what time will the car catch up to the Special?
- A. 3:30 pm
 B. 2:30 pm
 C. 3:00 pm
 D. 2:00 pm
 E. 1:30 pm
15. The design for a running track is comprised of a rectangle with a semicircle on each end (see the figure). The diameter of each semicircle is 30 feet. The area of the entire figure is 1000 square feet. If x represents the length of the entire track, choose the equation that would be used to solve for x . Simplify the equation.



- A. $30x + 225\pi = 1000$
 B. $30x + 900\pi = 1900$
 C. $30x + 225\pi = 1900$
 D. $30x + 900\pi = 1000$
 E. Cannot be determined