

1. Express the following statement as an inequality:
The reciprocal of p is at most 10.

- A. $\frac{1}{p} \leq 10$
B. $p \leq 10$
C. $\frac{1}{p} \geq 10$
D. $p \geq 10$
E. None of the above

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

$$\left(\frac{12x^{-4}y^5}{-3x^3y^{-1}} \right)^{-3}$$

- A. $\frac{12y^3}{x^4}$
B. $-\frac{y^{18}}{12x^{21}}$
C. $\frac{64x^{10}}{y^9}$
D. $-\frac{x^{21}}{64y^{18}}$
E. None of the above

3. Rewrite the following using radicals and simplify if possible.

$$(48x^5y^{12})^{\frac{1}{2}}$$

- A. $24x^5y^{12}$
B. $4x^5y^{12}(\sqrt{3})$
C. $24x^2y^6(\sqrt{x})$
D. $4x^4y^{12}(\sqrt{3x})$
E. $4x^2y^6(\sqrt{3x})$

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

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

- A. $-x^2 - 4xy^2 + y^4$
- B. $-x^2 + xy^2 + y^4$
- C. $5x^2 - 7xy^2 + y^4$
- D. $5x^2 - xy^2 + y^4$
- E. None of the above

5. Which of the following is a factor of $8x^2 - 2x - 3$?

- A. $4x + 1$
- B. $4x - 3$
- C. $8x - 3$
- D. $2x - 3$
- E. $8x + 1$

6. Factor $27a^3 - b^6$ completely given that $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$.

- A. $(3a - b^2)^3$
- B. $(3a + b^2)(3a - b^2)$
- C. $(3a - b^2)(3a^2 + 27a^3b^6 + b^4)$
- D. $(27a^3 - b^6)(9a^2 + 3ab^2 + b^4)$
- E. $(3a - b^2)(9a^2 + 3ab^2 + b^4)$

7. Solve the following equation. Choose the answer that best describes the solution.

$$\frac{3}{x-2} - \frac{x+10}{x^2-4} = \frac{2}{x+2}$$

- A. x is less than -2 .
- B. x is between -2 and 2 .
- C. x is greater than 2 .
- D. There is no solution for x .
- E. All real x are solutions except for $x = \pm 2$.

8. Simplify.

$$\frac{\frac{a-9b}{b} - \frac{a}{a-3b}}{b}$$

- A. $\frac{3}{a}$
 B. $\frac{a-3b}{a}$
 C. $\frac{a-9b}{a(a-3b)}$
 D. $\frac{a+3b}{a}$
 E. $\frac{-9b}{a-3b}$

9. Solve the following equation.

$$\frac{1}{3}(x+12)+2 = \frac{1}{2}(3x+1)$$

- A. $x = \frac{23}{7}$
 B. $x = \frac{13}{7}$
 C. $x = \frac{33}{7}$
 D. $x = \frac{3}{7}$
 E. There is no solution for x .

10. Rationalize the denominator and simplify.

$$\frac{\sqrt{x}-1}{\sqrt{x}+5}$$

- A. $\frac{x-6\sqrt{x}+5}{x-25}$
 B. $\frac{x-1}{x+25}$
 C. $\frac{x+4\sqrt{x}-5}{x+25}$
 D. $\frac{x-1}{x-25}$
 E. $\frac{\sqrt{x}-1}{x+5}$

11. Simplify.

$$\frac{x^2 + 3x - 4}{x^2 + 8x + 16} \cdot \frac{x^2 + 10x + 9}{x^2 - 1}$$

A. $\frac{(x-1)(x+9)}{x+4}$

B. $\frac{x+9}{x+4}$

C. $x+9$

D. $\frac{x+1}{x-4}$

E. $\frac{(x+1)(x+9)}{(x-4)(x-1)}$

12. Solve $R = P(nw + c)$ for n .

A. $n = \frac{R-P}{wc}$

B. $n = \frac{R-Pc}{Pw}$

C. $n = \frac{R}{Pwc}$

D. $n = \frac{R-c}{w}$

E. $n = \frac{R-c}{Pw}$

13. Anthony has \$25,000 to invest into two different funds. Fund A earns 4.5% simple interest. Fund B earns 5% simple interest. How much should he invest in **Fund A** so that he earns \$1,175 in simple interest for one year?

A. \$15,000

B. \$12,368

C. \$10,823

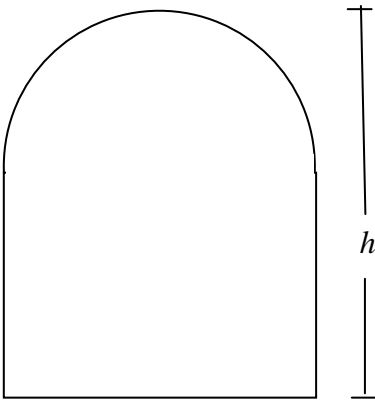
D. \$17,500

E. None of the above

14. Two children, who are 215 meters apart, start walking toward each other at the same instant. Mary is walking at a rate of 1.8 m/sec. while Joe is walking at a rate of 2.4 m/sec. After how many seconds will they meet? Round your answer to the nearest second.

- A. 48 seconds
B. 55 seconds
C. 39 seconds
D. 51 seconds
E. None of the above

15. A doorway in a new building is designed to be handicapped accessible. The shape of the doorway will be a rectangle surmounted by a semicircle (see the figure). The width of the door is to be 6 feet and the height, h , has yet to be determined. If the area of the doorway is to be 32 square feet, choose the equation used to find h . Simplify your equation.



- A. $6h + 36\pi = 32$
B. $6h + \frac{9}{2}\pi = 50$
C. $6h + 9\pi = 32$
D. $6h + 36\pi = 50$
E. $6h + \frac{9}{2}\pi = 32$