

1. Simplify the expression  $\sqrt[3]{\frac{x^{11}y^5}{x^2y^2}}$

A)  $x^{\frac{11}{2}}y^{\frac{3}{2}}$       B)  $x^3y$       C)  $x^4y\sqrt[3]{xy}$       D)  $x^2$

2. Simplify the expression  $\frac{x^2 + 2x - 15}{x^2 - 8x + 15}$

A)  $-\frac{1}{4}$       B)  $\frac{x+3}{x-3}$       C)  $-1$       D)  $\frac{x+5}{x-5}$

3. Simplify the expression  $\sqrt{12} - 2\sqrt{75} + \sqrt{48}$

A)  $-4\sqrt{3}$       B)  $9\sqrt{3} + \sqrt{10}$       C)  $\sqrt{3}$       D)  $-3\sqrt{10}$

4. Solve the system of equations given below.

$$\begin{aligned}2x - 3y &= 16 \\x + 8y &= -87\end{aligned}$$

A)  $(-4, -8)$       B)  $(23, 10)$       C)  $(-7, -10)$       D) The system is dependent.

5. Perform the indicated operations and simplify.  $(3 - 2\sqrt{5})(\sqrt{5} - 1)$

A)  $-8\sqrt{5}$       B)  $\sqrt{5} + 7$       C)  $5\sqrt{5} - 13$       D)  $5\sqrt{5} - 17$

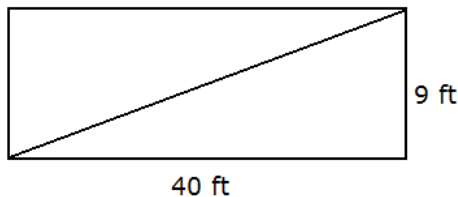
6. Find the **exact value** of the expression  $27^{-\frac{2}{3}}$ .

A)  $-18$       B)  $\frac{1}{9}$       C)  $\frac{\sqrt{3}}{243}$       D)  $0.11$

7. Find all real solutions of the equation  $x^2 = 2x + 1$

A)  $x = 1 + \sqrt{8}$  or  $x = 1 - \sqrt{8}$       C) There is no real solution.  
B)  $x = -1$       D)  $x = 1 + \sqrt{2}$  or  $x = 1 - \sqrt{2}$

8. Find the length of the diagonal of the rectangle shown on the picture below.



- A)  $7\sqrt{31}$  ft      B) 41 ft      C) 49 ft      D)  $6\sqrt{10}$  ft
9. Solve the equation  $\frac{2x + 3}{5} - \frac{x - 5}{3} = 1$   
A) There is no solution.      B) 31      C) -33      D) -19
10. Solve the equation  $\left| \frac{1}{3}x - 1 \right| + 3 = 7$ .  
A) -9, 15      B) -27, 15      C) -11, 13      D) 9
11. Rationalize the denominator in the expression  $\frac{3}{\sqrt{10} + 1}$ .  
A)  $\frac{\sqrt{10} - 1}{3}$       B)  $\sqrt{10} + 3$       C)  $\frac{\sqrt{10} + 1}{3}$       D)  $\sqrt{10} - 3$
12. Solve the inequality  $-2 \leq \frac{1}{3}x - 1 \leq 5$   
A) [-9, 12]      B) [-9, 18]      C) [-5, 16]      D) [-3, 18]
13. We have invested a total of \$5 000 in two bank accounts. One account earns 7% interest per year, the other earns 8% per year. How much did we invest at 8% if the combined interest from the two account was \$ 382?  
A) \$1 700      B) \$2 500      C) \$3 200      D) \$4 200



21. Find all solutions of the equation  $\frac{3}{p-7} + \frac{p+7}{p} = \frac{7p-28}{p(p-7)}$   
A)  $p = 14$       B)  $p = -11$  or  $p = 7$       C)  $p = -3$  or  $p = 7$       D)  $p = -3$
22. Solve the equation  $|x+1| = |3x-1|$   
A)  $x = 0$  or  $x = 1$       B)  $x = 0$       C)  $x = 1$       D)  $x = 1$  or  $x = -1$
23. Suppose that  $f$  is a function given by  $f(x) = x^2 + 4x + 2$ . Compute the value of  $f(-5)$ .  
A) 7      B) -43      C) -3      D) 3
24. Suppose that  $f$  is a function given by  $f(x) = \frac{1}{x^2 - 16}$ . What is the domain of  $f$ ?  
A)  $(-\infty, -4) \cup (4, \infty)$       C)  $[-4, 4]$   
B) all real numbers except  $-4$  and  $4$       D)  $4$  and  $-4$
25. The graph of which equation shown below is a parabola with its vertex at  $(3, -4)$ ?  
A)  $y = x^2 - 3x - 4$       C)  $y = x^2 - 6x + 5$   
B)  $y = x^2 + 3x - 22$       D)  $y = x^2 + 6x - 31$
26. Find the coordinates of the vertex of the parabola  $y = 2x^2 - 20x + 18$   
A)  $(5, -32)$       C)  $(-5, -32)$   
B)  $(5, -16)$       D)  $(-5, -16)$