

1. Simplify each of the following expressions.

(a) $3\sqrt{28} - 5\sqrt{63} + 2\sqrt{175} =$

(b) $(2 - 3\sqrt{7})(\sqrt{7} + 1) =$

(c) $(3\sqrt{7} - 2)(3\sqrt{7} + 2) =$

(d) $(2\sqrt{5} - 3)^2 =$

(e) $(3x^2 - 2x - 6) - (-x^2 - 3x + 4) =$

(f) $\frac{w^2 - 4w - 96}{w^2 - 16w + 48} =$

(g) $\frac{x^3 - 3x^2}{x^2 + 4x - 21} \cdot \frac{6x + x^2 - 7}{2x^2 - 2x} =$

(h) $\frac{5a + 14}{4a + a^2 - 12} - \frac{2}{a + 6} =$

(i) $\frac{x^2 - 5x}{x^2 - 2x - 15} \cdot \frac{18 - 2x^2}{x^2 - 3x} =$

(j) Rationalize the denominator in the expression $\frac{4x - 9}{2\sqrt{x} - 3} =$

2. Find the exact value of $3x^2 - 12x - 3$ if $x = 2 - \sqrt{7}$.

3. Solve each of the following equations. Make sure to check your solutions.

(a) $\frac{5x + 1}{28} + \frac{12x - 6}{56} = \frac{x - 1}{14}$

(b) $8x^2 + x^3 = 33x$

(c) $3|x + 3| - 5 = 10$

(d) $|2x - 7| + 8 = -1$

(e) $|x - 8| - 1 = 1$

(f) $\left|\frac{x}{2} - 1\right| - 5 = 10$

(g) $2(x - 3) - \frac{x}{2} = \frac{3}{2}(x - 4)$

4. Solve each of the following inequalities. Graph the solution set.

(a) $(2 - 3x)(x - 5) \leq 4 - (x - 3)(3x + 2)$

(b) $\frac{5 - 4x}{3} - \frac{2x - 7}{5} > -2x + 2$

5. Solve each of the following formulas.
- (a) $PV = nRT$ for T
 - (b) $A = \frac{1}{2}h(B + b)$ for h
 - (c) $2x + 3y = 12$ for y
6. Graph the straight lines determined by the equations $3x + 2y = 6$ and $x + y = 4$.
- (a) Use your graph to find the coordinates of the point where the lines intersect.
 - (b) Use algebraic methods to check your answer.
7. We have placed \$2500 in a bank account with an annual 8% interest rate. How much money do we have after one year?
8. There is an animal farm where chickens and cows live. There are 68 heads and 252 legs. How many chickens, how many cows?
9. A bank teller has 47 more five-dollar bills than ten-dollar bills. The total value of the money is \$1000. How much of each denomination of bill does he have?
10. Find an equation of the straight line that is parallel to $y = 3x - 7$ and passes through the point $(3, 11)$.
11. Find an equation of the straight line that is perpendicular to $2x - 7y = 42$ and passes through the point $(2, 2)$.
12. Find an equation of the line that passes through the points $(1, -7)$ and $(7, -4)$.