

Section 1.1 Solving Equations

- Objective: 1. Translate verbal expressions into Algebraic expressions
2. Solve equations using properties of equality.

Verbal to Algebraic

1. 7 less than a number

$x - 7$

7 less a number

$7 - x$

2. Three times the square of a number

$3x^2$

3. The cube of a number increased by 4 times the same number

$x^3 + 4x$

4. twice the sum of a number and five

$2(x+5)$

5. The product of a number and six decreased by the quotient of the same number and 4.

$6x - \frac{x}{4}$

6. twice a number less than six times the same number.

$6x - 2x$

Properties of equality

1. Addition Property

$$\begin{array}{r} x - 4 = 10 \\ + 4 \quad + 4 \\ \hline x = 14 \end{array}$$

2. Subtraction Property

$$\begin{array}{r} x + 3 = 10 \\ - 3 \quad - 3 \\ \hline x = 7 \end{array}$$

3. Multiplication Property

$$\begin{array}{r} \cancel{2} x = 5 \cdot \cancel{2} \\ \hline x = 10 \end{array}$$

4. Division Property

$$\begin{array}{r} 3x = 12 \\ \hline \frac{3}{3} x = \frac{12}{3} \\ x = 4 \end{array}$$

Solving one step equations.

$$\begin{array}{r} a + 14 = 65 \\ -14 \quad -14 \\ \hline a = 51 \end{array}$$

$$\begin{array}{r} x - 5.5 = 6 \\ + 5.5 \quad + 5.5 \\ \hline x = 11.5 \end{array}$$

$$\begin{array}{r} 5 \cdot \frac{-3}{5} d = 18 \cdot 5 \\ \hline -3d = 90 \\ \frac{-3d}{-3} = \frac{90}{-3} \quad d = -30 \end{array}$$

$$\begin{array}{r} 2 \cdot 18 = \frac{1}{2} y \\ \hline 36 = y \end{array}$$

$$\begin{array}{r} 4x = 12 \\ \frac{4x}{4} = \frac{12}{4} \\ \hline x = 3 \end{array}$$

Solve:

$$\begin{aligned}2(2x+3) - 3(4x-5) &= 22 \\4x+6 - 12x+15 &= 22 \\-8x+21 &= 22 \\-8x &= 1 \\x &= -\frac{1}{8}\end{aligned}$$

$$53 = 3(y-2) - 2(3y-1)$$

Solve for Variables

$$S = \pi r l + \pi r^2 \quad \text{solve for } l$$

$$A = \frac{(b_1 + b_2)h}{2} \quad \text{solve for } h$$

If $3n - 8 = 5$ What is the value of $3n - 3$

If $4x + 5 = 29$ What is the value of $4x - 2$

Fraction Busting

1. Find the common denominator
2. Multiply each term by the common denominator
3. Solve
4. You just fraction busted!!!!

$$\frac{1}{3}x + \frac{2}{6} = 4$$

$$\frac{3}{5}x + \frac{1}{15}x = \frac{14}{15}$$

Solve

$$\frac{2}{3}x + \frac{4}{5}x = \frac{3}{5}$$

$$\frac{1}{4}(x + 6) = \frac{2}{5}(3x - 1)$$

$$\frac{2}{7}(2x - 5) = \frac{1}{2}x + 3$$