Solving Linear Equations

Foundations of College Algebra

General Strategy

To solve linear equations in one variable:

1. Find the least common denominator of all the fractions in the equation. Multiply both sides of the equation by that LCD. This clears the fractions.
2. Simplify each side of the equation as much as possible. Use the Distributive Property to remove any parentheses. Combine like terms.
3. Collect all the variable terms on one side of the equation.
4. Collect all the constant terms on the other side of the equation.
5. Make the coefficient of the variable term to equal to 1. State the solution to the equation.
6. Check the solution.

Variables on One Side of the Equation

Examples

Solve the equations.

1. $-14q-2=16$

2. $-10(x+4)-19=85$

Do Problem Set A

Variables on Both Sides of the Equation

Examples

Solve the equations.

1. $9p+14=6+4p$

2. $-15+4(2-5y)=-7(y-4)+4$

Do Problem Set B

Equations with Fractions

Example

Solve the equations.

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

2. $\frac{4q+3}{2}+6=\frac{3q+5}{4}$

Do Problem Set C

Problem Set A.

Solve and check the following equations:

1. $12x - 8 = 64$

2. $35 = -13y + 9$

3. $-(t - 19) = 28$

4. $8(9b - 4) - 12 = 100$

5. $-2(11 - 7x) + 54 = 4$

Problem Set B.

Solve and check the following equations:

1. $8x - 15 = 7x + 3$

2. $8c + 7 = -3c - 37$

3. $4(a - 12) = 3(a + 5)$

4. $12 + 2(5 - 3y) = -9(y - 1) - 2$

Problem Set C

Solve the following equations:

1. $\frac{1}{4}x - \frac{1}{2} = -\frac{3}{4}$

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

3. $\frac{1}{2}a - \frac{1}{4} = \frac{1}{6}a + \frac{1}{12}$

4. $\frac{3x+4}{2} + 1 = \frac{5x+10}{8}$