

Starter 18 SEP 2018

1) Solve: $6 - 2(x + 4) = 10$

$$\begin{array}{r} 6 - 2x - 8 = 10 \\ -2x - 2 = 10 \\ \quad +2 \quad +2 \\ \hline -2x = 12 \\ \quad -2 \quad -2 \\ \hline x = -6 \end{array}$$

2) Solve: $\frac{2}{3}x = 12$

$$\frac{2}{3}x = 12 \cdot \frac{3}{2}$$

$$x = 18$$

Algebra 1: 3.4 SOLVING EQUATIONS WITH VARIABLES ON BOTH SIDES

Goal: Get ONE variable alone on one side of = sign.

- Use Distributive Property, if necessary.
- Combine like terms, if necessary
- Move one variable by adding its inverse to both sides of =.
- Solve as usual.

1. $12k + 15 = 35 + 2k$ Original problem

$$\begin{array}{r} 12k + 15 = 35 + 2k \\ -2k \quad -2k \\ \hline 10k + 15 = 35 \\ -15 \quad -15 \\ \hline 10k = 20 \\ \frac{10k}{10} = \frac{20}{10} \\ k = 2 \end{array}$$

Move variables to one side.
Eliminate adding or subtracting
Eliminate multiplying or dividing

Solution! Remember...Check Your Answer!

2. $3(a + 22) = 12a + 30$ Original Problem

$$\begin{array}{r} 3a + 66 = 12a + 30 \\ -3a \quad -3a \\ \hline 66 = 9a + 30 \\ -30 \quad -30 \\ \hline 36 = 9a \\ \frac{36}{9} = \frac{9a}{9} \\ 4 = a \end{array}$$

Do the Distributive Property First!!!
Move Variables to one Side.
Eliminate adding or subtracting
Eliminate multiplying or dividing

Solution! Remember...Check Your Answer!

3. $3(x + 1) - 5 = 5x - 2$ Original Problem

$$\begin{array}{r} 3x + 3 - 5 = 5x - 2 \\ 3x - 2 = 5x - 2 \\ -3x \quad -3x \\ \hline -2 = 2x - 2 \\ +2 \quad +2 \\ \hline 0 = 2x \\ \frac{0}{2} = \frac{2x}{2} \\ 0 = x \end{array}$$

Do the Distributive Property First!!!
Combine Like Terms
Move Variables to one Side.
Eliminate adding or subtracting
Eliminate multiplying or dividing

Solution! Remember...Check Your Answer!

Steps to Solving Equations

- 1) SIMPLIFY each side of the equation (distributive, combine like terms)
- 2) Move the variables to the same side by using the inverse of addition or subtraction
- 3) Undo Addition/Subtraction
- 4) Undo Multiplication/Division

Algebra 1: 3.4 Solving Equations Homework
Solve the Equation. Show all Steps!!!

1. $4x - 6 = x + 9$

$$\begin{array}{r} -x \quad -x \\ \hline 3x - 6 = 9 \\ +6 \quad +6 \\ \hline 3x = 15 \\ \frac{3x}{3} = \frac{15}{3} \\ x = 5 \end{array}$$

- 1) Simplify ✓
- 2) Variables together ✓
- 3) Undo +/- ✓
- 4) Undo */÷

$x = 5$

2. $4 + 7x = 1 - 6x$

$$\begin{array}{r} +6x \quad +6x \\ \hline 4 - 1x = 1 \\ -4 \quad -4 \\ \hline -1x = -3 \\ \frac{-1x}{-1} = \frac{-3}{-1} \\ x = 3 \end{array}$$

- 1) Simplify ✓
- 2) Variables together ✓
- 3) Undo +/- (#s) ✓
- 4) Undo */÷ ✓

$x = 3$

3. $-4x - 3 = -6x + 9$

$$\begin{array}{r} +6x \quad +6x \\ \hline 2x - 3 = 9 \\ +3 \quad +3 \\ \hline 2x = 12 \\ \frac{2x}{2} = \frac{12}{2} \\ x = 6 \end{array}$$

- 1) Simplify ✓
- 2) Variables together ✓
- 3) Undo +/- (#s) ✓
- 4) Undo */÷

$x = 6$

$-3 = -2x + 9$
 $-9 = -2x$
 $-12 = -2x$

5. $6(2+y) = 3(3-y)$

1) Simplify

2) Variables together

3) Undo +/-

4) Undo */÷

6. $4y = 2(y-5) - 2$

1) Simplify

2) Variables together

3) Undo +/-

4) Undo */÷