

Algebra 1: 1.5 Solving Equations with Variables on Both Sides

These equations are very similar, and the terms are moved around exactly the same.

Try to solve at least the left one.

$$3x - 7 = 12$$

~~3x~~ ~~-7~~ ~~=~~ ~~12~~
+7 +7

$$\frac{3x}{3} = \frac{19}{3}$$

~~3x~~ ~~=~~ ~~19~~
~~3~~ ~~3~~

$$x = \frac{19}{3}$$

$$3 - 7x = 12x$$

~~3~~ ~~-7x~~ ~~=~~ ~~12x~~
+7x +7x

$$\frac{3}{19} = \frac{19x}{11}$$

~~3~~ ~~=~~ ~~19x~~
~~19~~ ~~11~~

$$x = \frac{3}{19}$$

Lesson 1.5 Solving Equations with Variables on Both Sides

Strategy:

1. Simplify each side before "moving" anything around.
2. Get all your variables on one side
3. Solve.

$$3(3x - 4) = \frac{1}{4}(32x + 56)$$

Dist. but by multiplying →

$$9x - 12 = \cancel{8x} + 14$$

Get variables on one side ←

$$x - 12 = 14$$

$$+12 \quad +12$$

$$x = 26$$

Solve →

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Ex: Solve $\frac{1}{2}(6h-4) = -5h+1$

Simplify
each
side
first

$$3h - 2 = -5h + 1$$

$$8h - 2 = 1$$

$$8h = 3$$

$$h = \frac{3}{8}$$

Special Cases:

Sometimes your variables will end up cancelling out.

$$3(5x + 2) = 15x$$

$$\begin{array}{r} 15x + 6 = 15x \\ -15x \quad -15x \end{array}$$

$$6 = 0$$

False statement! This means there are no solutions.

if the statement was true it would have Infinitely many solutions.

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Ex: Solve $-2(4y+1) = -8y-2$

$$\begin{array}{r} -8y - 2 = -8y - 2 \\ +8y \quad \quad +8y \end{array}$$

$$-2 = -2$$

True
infinitely many solutions

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Homework:

Pg 35-36

Numbers: 3-6, 9-12, 19-21, 29, 30