

Algebra 1 - 1.4 Solving Multi-Step Equations

- Solve multi-step equations
 - Use multi-step equations to solve real life problems
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Warmup: State the operation(s) used in the expressions below

$$-4x$$

multiplication

$$x + 17$$

addition

$$\frac{x}{3} - 25$$

division & subtraction

$$3 - 8x$$

subtraction & multiplication

$$16 + \frac{x}{4}$$

addition & division

Exploring Reciprocals and Dividing:

Do these on a calculator and write the answer.

$\frac{2}{3} \div 2$ $\frac{1}{3}$	$\frac{2}{3} \cdot \frac{1}{2}$ $\frac{1}{3}$	coincidence?
$7 \div \frac{1}{3}$ 21	$7 \cdot 3$ 21	another coincidence?

What do you think the pattern is?

Try to repeat the pattern with this division problem.

$6 \div \frac{2}{3}$ 9	$?$ $6 \cdot \frac{3}{2}$ 9
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Dividing by Any number is equal to multiplying by its reciprocal (the number flipped up side down)

Math Fact: Multiplying numbers by their reciprocals will equal 1

$$\frac{5}{6} \cdot \frac{6}{5} = 1$$

$$\frac{2}{3} \cdot \frac{3}{2} = 1$$

$$-\frac{11}{7} \cdot -\frac{7}{11} = 1$$

Getting rid of Fractions:

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

$$- \frac{1}{3} \quad - \frac{1}{3}$$

$$x = \frac{5}{3}$$

$$\frac{3}{1} \cdot \frac{1}{3} x = 2 \cdot \frac{3}{1}$$

$$x = 6$$

Remember: When adding and subtracting, you need to get 0 to cancel. When multiplying and dividing, you need to get 1. (this is because $x + 0$ is just x , and $1x$ is also just x)

How to tell WHEN to do WHAT step?!

$$-6x + 17 = 29$$

When deciding what steps to take first. Follow the Order of Operations BACKWARDS!

Add/Subtract first

$$-6x + 17 = 29$$

-17 -17

Multiply/Divide second

$$\frac{-6x}{-6} = \frac{12}{-6}$$
$$x = 2$$

Tip: Figure out where the variable is, and Only focus on that side of the equation! Don't let the other side distract you from what needs to be done!

$$\text{Ex: } 6 + 5(m+1) = 26$$

Remember. Do the order of operations backwards.

PEMDAS



$$6 + 5(m+1) = 26$$

-6 -6

add / subtract
First

$$\frac{5(m+1)}{5} = \frac{20}{5}$$

divide

$$m+1 = 4$$

$$-1 \quad -1$$

$$m = 3$$

Combining like terms Before solving.

$$\underline{12v} - 8 - \underline{2c} = -16$$

$$10v - 8 = -16$$

+8 +8

$$\frac{10v}{10} = \frac{-8}{10}$$

$$v = -\frac{8}{10}$$

$$v = -\frac{4}{5}$$

$$27 = 3c - 3(b - 2c)$$

$$27 = \underline{3c} - 18 + \underline{6c}$$

$$27 = -18 + 9c$$

$$+18 \quad +18$$

$$\frac{45}{9} = \frac{9c}{9}$$

$$c = 5$$

If you have multiple terms with your variable.

Combine those like terms first.

Homework:

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Numbers: 3-5, 9-11, 14, 19, 20, 44

Attachments

MOfficePNG.png