Solving two-step equations with fractions and decimals
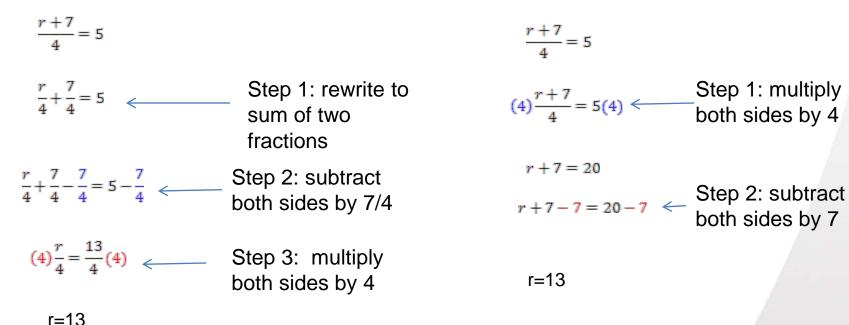
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Two methods for solving two step equations

Method 1: isolate the variable

$$\frac{r+7}{4} = 5$$

$$\frac{r}{4} + \frac{7}{4} = 5$$

Step 1: rewrite to sum of two fractions

$$\frac{r}{4} + \frac{7}{4} - \frac{7}{4} = 5 - \frac{7}{4}$$

Step 2: subtract both sides by 7/4

$$(4)\frac{r}{4} = \frac{13}{4}(4)$$

Step 3: multiply both sides by 4

r=13

Method 2: Multiply both sides by the denominator

$$\frac{r+7}{4} = 5$$

$$(4)\frac{r+7}{4} = 5(4)$$

Step 1: multiply both sides by 4

$$r + 7 = 20$$

$$r + 7 - 7 = 20 - 7$$

Step 2: subtract both sides by 7

r=13

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Solving two step word problem

The Smith family spent $52.00 on concert tickets. This cost included a $3.25 service fee for buying them online and the original cost of the ticket was $9.75 each. How many tickets did the Smiths buy?

Total cost   =   tickets   +   service fee

$$52.00 = 9.75t + 3.25$$

$$52.00 - 3.25 = 9.75t + 3.25 - 3.25$$

Step 1: subtract 3.25 from each side

$$\frac{48.75}{9.75} = \frac{9.75t}{9.75}$$

Step 2: divide both sides by 9.75

$$5 = t$$

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Ideas for application

- Create personally-relevant word problems
  - Example: Your car broke down, labor to fix it cost $40 per hour plus $430 for the parts. The total cost is $630. How many hours of labor did it take?

- Color code parts of the equation as shown in the examples in this PowerPoint

- Check answers by plugging the answer into the original equation to make sure both sides are equal

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Making connections

- Multiplying and dividing decimals address the following 6th and 8th grade Core Content Connectors
  - 6.NO.2c3 Solve one step addition, subtraction, multiplication, or division problems with fractions or decimals
  - 8.NO.2i4 Solve two step addition, subtraction, multiplication, and division problems with fractions, decimals, or positive/negative numbers

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