

4-5 2-Step Equations

p. 201

$$\begin{array}{r} 4x + 3 = 23 \\ -3 \quad -3 \\ \hline \end{array}$$

$$\begin{array}{r} 4x = 20 \\ \cancel{4} \quad \cancel{4} \\ \hline \end{array}$$

$$x = 5$$

$$4 \cdot 5 + 3 = 23 \text{ (✓)}$$

- You are working to get the variable by itself.
- The $+3$ is not linked to the variable, so -3 first.
- Use division (opposite of multiplication) to remove the 4 .

• Check your answer!

Example to follow:

$$\begin{array}{r} 7x + 5 = 61 \\ -5 \quad -5 \\ \hline \end{array}$$

$$\begin{array}{r} 7x = 56 \\ \cancel{7} \quad \cancel{7} \\ \hline \end{array}$$

$$x = 8$$

$$7 \cdot 8 + 5 = 61 \text{ (✓)}$$

Your turn:

$$6x + 1 = 25$$

$$\begin{array}{r} + 1 = 25 \\ - 1 \quad -1 \\ \hline \end{array}$$

check:

Using integers examples:

$$\begin{array}{r} 8x - 2 = -50 \\ +2 \quad +2 \\ \hline \end{array}$$

$$\begin{array}{r} 8x = -48 \\ \cancel{8} \quad \cancel{8} \\ \hline \end{array}$$

$$x = -6$$

$$8 \cdot (-6) - 2 = -50 \text{ (✓)}$$

Your turn:

$$4x - 5 = -33$$

$$\begin{array}{r} - 5 = -33 \\ + 5 \quad +5 \\ \hline \end{array}$$

check:

$$\begin{array}{r} -2x + 3 = -21 \\ -3 \quad +3 \leftarrow \text{"flip"} \\ \hline \end{array}$$

$$\begin{array}{r} -2x = -24 \\ \cancel{-2} \quad \cancel{-2} \\ \hline \end{array}$$

$$x = 12$$

$$-2 \cdot 12 + 3 = -21$$

$$-3x + 1 = -8$$

$$\begin{array}{r} + 1 = -8 \\ - 1 \quad -1 \\ \hline \end{array}$$

check:

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Working with other operations

the 12 is not linked to the "p"

$$\frac{p}{5} - 12 = 20$$
$$\begin{array}{r} +12 \\ +12 \end{array}$$

$$\frac{p}{6} - 2 = 9$$

the inverse of $\frac{1}{5}$ is $\frac{5}{1}$

$$\frac{5}{1} \cdot \frac{p}{5} = 32 \cdot 5$$

$$p = 160$$

$$\text{check: } \frac{160}{5} - 12 = 20$$

check:

$$-\frac{1}{9}x - 4 = 5$$
$$\begin{array}{r} +4 \\ +4 \end{array}$$

$$-\frac{1}{6}x - 3 = 2$$

$$\frac{9}{1} \cdot -\frac{1}{9}x = 9 \cdot 9$$

$$x = -81$$

$$\text{check: } -\frac{1}{9} \cdot -81 - 4 = 5$$

check:

What to do w/ a negative coefficient!

-m is really -1m

$$-8 - m = 32$$
$$\begin{array}{r} +8 \\ +8 \end{array}$$

$$-m = 40$$
$$\begin{array}{r} -1 \\ -1 \end{array}$$

$$m = -40$$

$$\text{check: } -8 + 40 = 32 \checkmark$$

$$-15 - b = 44$$

check:

Combining terms!

Combine like terms

$$5 - 10x + 2x = 37$$

$$5 - 8x = 37$$

the opposite of 5 is -5

$$\begin{array}{r} -5 \\ -5 \end{array}$$

$$-8x = 32$$

$$\begin{array}{r} -8 \\ -8 \end{array}$$

$$x = -4$$

$$\text{check: } 5 - 8 \cdot -4 = 37$$

$$4 - 9c + 3c = 58$$

check:

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Write the equations:

Nikki spent \$95 for presents. This is \$15 more than 4 times the amount Savannah spent on her holiday shopping.

A gym charges a \$50 activation fee and \$17 per month for membership. Brayden paid \$356. For how many months does he have gym membership for?

Aiden swam for 85 minutes. This is 21 more minutes than 4 times the minutes Sam swam.

The quotient of a number and 3, less 8, is 16.

* SCA washed 14 fewer cars in their summer car wash than in their spring car wash. They washed a total of 96 cars during both car washes. How many cars were washed in the summer car wash?