

AIM: 3-5 How do we solve TWO-STEP equations?

Name _____

Date Key
Math 6 - Period _____

Warm-up: Solve and check each equation below.

a) $x + 4.5 = 19.1$
 $\begin{array}{r} x + 4.5 = 19.1 \\ -4.5 \quad -4.5 \\ \hline x = 14.6 \end{array}$

$x = 14.6$

3-Step Check:

① $x + 4.5 = 19.1$

② $14.6 + 4.5 = 19.1$
✓

③ $19.1 = 19.1$ ✓

b) $\frac{x}{3} = 2.4 \cdot 3$
 $x = \frac{2.4 \cdot 3}{3}$
 $\frac{7.2}{3}$

$x = 7.2$

3-Step Check:

① $\frac{x}{3} = 2.4$

② $7.2 \div 3 = 2.4$

$\frac{2.4}{3} = 2.4$
 $3 \overline{) 7.2}$
 $\underline{-6}$
 12
 $\underline{-12}$
 0 ✓

$5x - 7 = 13$ is a TWO-STEP EQUATION

A two-step equation has two different operations.

Can you find the value of x for the equation:

$5x - 7 = 13$

* Watch Edpuzzle *

before moving inna — Try after

When solving TWO-STEP equations, we must do GEMDAS in the reverse order.
 (Undo addition or subtraction first and then undo multiplication or division)

Example 1: Solve for x.

$$5x - 7 = 13$$

Inverse Operation: $5x - 7 = 13$
 $\xrightarrow{+7 \quad +7}$
 Zero Out: $\frac{5x}{5} = \frac{20}{5}$
 Inverse Operation: $x = 4$
 Cross Out:

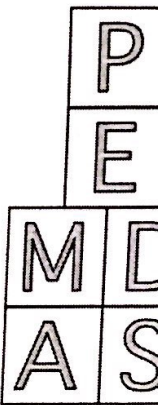
3-STEP CHECK:

$$5x - 7 = 13, \text{ if } x = 4$$

$$5(4) - 7 = 13$$

$$20 - 7 = 13$$

$$13 = 13 \quad \checkmark$$



SOLVE the TWO-STEP EQUATIONS below and CHECK when asked.

1) $2x + 3 = 9$
 $\xrightarrow{-3 \quad -3}$
 $\frac{2x}{2} = \frac{6}{2}$
 $x = 3$

3-Step Check:

- $2x + 3 = 9$
- $2(3) + 3 = 9$
 $6 + 3 = 9$
- $9 = 9 \quad \checkmark$

2) $5x - 2 = 13$
 $\xrightarrow{+2 \quad +2}$
 $\frac{5x}{5} = \frac{15}{5}$
 $x = 3$

3) $\frac{x}{5} + 4 = 19$
 $\xrightarrow{-4 \quad -4}$
 $\frac{x}{5} = 15$
 $\cdot 5 \cdot 5$
 $x = 75$

4)

$$\begin{array}{r|l} \frac{x}{6} - 8 = 22 & \\ \cancel{-8} & +8 \\ \hline 6 \cdot \frac{x}{6} = 30 \cdot 6 & \\ \hline \boxed{x = 180} & \end{array}$$

3-Step Check:

- 1) $\frac{x}{6} - 8 = 22$
- 2) $180 \div 6 - 8 = 22$
 $30 - 8 = 22$
- 3) $22 = 22 \checkmark$

5)

$$\begin{array}{r|l} 3x + 3.5 = 12.5 & \\ \cancel{-3.5} & -3.5 \\ \hline \frac{3x}{3} = \frac{9.0}{3} & \\ \hline \boxed{x = 3} & \end{array}$$

3-Step Check:

- 1) $3x + 3.5 = 12.5$
- 2) $3 \cdot 3 + 3.5 = 12.5$
 $9 + 3.5 = 12.5$
- 3) $12.5 = 12.5 \checkmark$

6) What value of x makes the equation below true?

- a) 12
- b) 10
- c) 9
- d) 8

$$\begin{array}{r} 4x - 7 = 43 \\ \cancel{-7} \quad \cancel{-7} \\ \hline 4x = 50 \\ \hline x = 12.5 \end{array}$$

7) What is the first step in solving the equation: $2x + 5 = 10$?

- a) Divide by two
- b) Subtract five from both sides
- c) Add five to both sides
- d) Multiply by two

8) Solve the equation for x.

a) $x = 4$

b) $x = 1$

c) $x = 3$

d) $x = 6$

$$\frac{4(x + 2)}{4} = \frac{12}{4}$$

$$\begin{aligned} x + 2 &= 3 \\ -2 &-2 \\ \hline x &= 1 \end{aligned}$$

9) A company sells boxes of crayons. The table shows the number that are contained in x boxes.

Part A: Which equation represents the relationship between x and y?

a) $y = 35 + x$

b) $x = 35 + y$

c) $x = 35y$

d) $y = 35x$

$$\begin{aligned} 840 &= 35(24) \\ 840 &= 840 \checkmark \end{aligned}$$

Number of Boxes (x)	Number of Crayons (y)
24	840
36	1,260
50	1,750

Part B: Based on the relationship shown in the table, how many crayons are in 15 boxes?

$$15 \cdot 35 = 525 \text{ crayons}$$



Explain, in complete sentences, how to solve the equation: $3y + 8 = 14$.

Then, give the answer.

First, subtract 8 from both sides, to get $3y = 6$.

Then, divide ^{by} 3 on both sides to get $y = 2$.