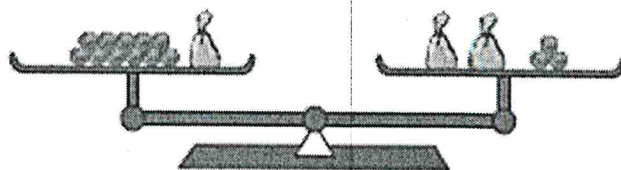


Practice Test: Solving Equations | MFM2P

1) In the scale diagram at the right, each bag contains the same number of candies.



a) Create an equation that models the scale diagram, where "x" is the number of candies in each bag.

Equation: $11 + x = 2x + 3$

$-2x$ $-2x$

b) Determine the number of candies in one bag any way you'd like, but justify your answer.

$$\begin{array}{r} 11 + x = 3 \\ -11 \quad -11 \\ \hline -x = -8 \\ \boxed{x = 8} \end{array}$$

8 candies in each bag.

2) Solve the following two-step equations using the balancing method:

a) $2x + 10 = 40$

$$\begin{array}{r} -10 \quad -10 \\ \hline 2x = 30 \\ \frac{2}{2} \quad \frac{2}{2} \\ \hline \boxed{x = 15} \end{array}$$

b) $0.2x + 0.7 = 2.1$

$$\begin{array}{r} -0.7 \quad -0.7 \\ \hline 0.2x = 1.4 \\ \frac{0.2}{0.2} \quad \frac{0.2}{0.2} \\ \hline \boxed{x = 7} \end{array}$$

c) $15 = 4x - 25$

$$\begin{array}{r} +25 \quad +25 \\ \hline 40 = 4x \\ \boxed{10 = x} \end{array}$$

d) $180 = 39 + 3x$

$$\begin{array}{r} -39 \quad -39 \\ \hline 141 = 3x \\ \boxed{47 = x} \end{array}$$

3) Solve the following problems that involve the distributive law:

a) $2(x - 4) = -10$

$$\begin{array}{r} 2x - 8 = -10 \\ +8 \quad +8 \\ \hline 2x = -2 \\ \boxed{x = -1} \end{array}$$

b) $3(x + 4) = 2(x + 7)$

$$\begin{array}{r} 3x + 12 = 2x + 14 \\ -2x \quad -2x \\ \hline x + 12 = 14 \\ \boxed{x = 2} \end{array}$$

Practice Test: Solving Equations | MFM2P

4) Solve the following problems that involve the fractions:

a) $\left(\frac{x}{5} - 3 = 22\right) \times 5$

$$x - 15 = 110$$

$$x = 125$$

b) $\left(5 + \frac{x}{5} = \frac{x}{15} + 9\right) \times 15$

$$75 + 3x = x + 135$$

$$-x \quad -x$$

$$75 + 2x = 135$$

$$-75 \quad -75$$

$$\frac{2x}{2} = \frac{60}{2}$$

$$x = 30$$

5) Solve the following equations, and check your answer!

Equation:

$$9x - 41 = 3x - 11$$

Solution:

$$6x - 41 = -11$$

$$+41 \quad +41$$

$$6x = 30$$

$$x = 5$$

Am I right?

Does $9(5) - 41 = 3(5) - 11$?

$$45 - 41 = 15 - 11$$

$$4 = 4$$



Practice Test: Solving Equations | MFM2P

Equation:

$$2 \left(\frac{1}{2}x - 5 = x - 10 \right)$$

Solution:

$$\begin{array}{r} 2x - 10 = 2x - 20 \\ -2x \quad -2x \\ \hline \end{array}$$

$$\begin{array}{r} -x - 10 = -20 \\ +10 \quad +10 \\ \hline \end{array}$$

$$-x = -10$$

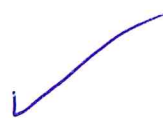
$$\boxed{x = 10}$$

Am I right?

$$\text{Does } \frac{1}{2}(10) - 5 = 10 - 10$$

$$5 - 5 = 0$$

$$0 = 0$$



6) For the solution below, circle the **specific mistake** made and **explain** in point form what is wrong.

$$\begin{array}{r} 2x - 1 = 13 \\ \textcircled{-1} \quad \textcircled{-1} \\ 2x = 12 \end{array}$$

(divide each side by 2)

$$x = 6$$

you must use the opposite operation and ADD 1.

7) For the solution below, circle the **specific mistake** made and **explain** in point form what is wrong.

$$\begin{array}{r} 5x + 2 = 22 \\ -2 \quad -2 \\ 5x = 20 \\ \textcircled{-5} \quad \textcircled{-5} \\ x = 15 \end{array}$$

you must divide by 5!

Practice Test: Solving Equations | MFM2P

8) Solve the following equation by using the distributive law, collecting like terms, and then using opposite operations.

$$2(x + 3) + 4x = 3(x + 6) - 6$$

$$2x + 6 + 4x = 3x + 18 - 6$$

$$6x + 6 = 3x + 12$$

$$\begin{array}{r} -3x \end{array} \quad \begin{array}{r} -3x \end{array}$$

$$3x + 6 = 12$$

$$\begin{array}{r} -6 \end{array} \quad \begin{array}{r} -6 \end{array}$$

$$3x = 6$$

$$\boxed{x = 2}$$

9) When solving equations with fractions we saw that it was important to be able to find a LCM to clear the fractions.

a) Find the LCM (least common multiple) of the numbers 2, 3, and 4. Hint... use multiplication.

$$2 \times 3 \times 4 = 24$$

b) Solve the equation:

$$24 \left(\frac{x}{4} + \frac{x}{3} + 1 = \frac{x}{2} + 3 \right)$$

(12 is good too)

$$6x + 8x + 24 = 12x + 72$$

$$14x + 24 = 12x + 72$$

$$\begin{array}{r} -12x \end{array} \quad \begin{array}{r} -12x \end{array}$$

$$2x + 24 = 72$$

$$\begin{array}{r} -24 \end{array} \quad \begin{array}{r} -24 \end{array}$$

$$\frac{2x}{2} = \frac{48}{2}$$

$$\boxed{x = 24}$$

Practice Test: Solving Equations | MFM2P

10) Mr. Smith and his friend are comparing how many wins they have in one of their favourite games: Hearthstone.

Mr. Smith: Has 400 wins, and wins 5 games every day.

Friend: Has 520 wins, and wins 2 games every day.



Here is an equation that models Mr. Smith's wins: $W = 400 + 5d$

a) Can you make an equation that models his friend's win total? $W = 520 + 2d$

b) How many wins will each person have in 25 days?

Mr. Smith:

$$W = 400 + 5(25)$$

$$W = 525 \text{ wins}$$

Friend:

$$W = 520 + 2(25)$$

$$W = 570 \text{ wins.}$$

c) Solve the following equation: $400 + 5d = 520 + 2d$

$$\begin{array}{r} 400 + 5d = 520 + 2d \\ -2d \quad -2d \\ \hline 400 + 3d = 520 \\ -400 \quad -400 \\ \hline 3d = 120 \\ \boxed{d = 40} \end{array}$$

d) How many days will it take until they have the same amount of wins?

40 days

e) How many wins do they each have on this day? (Hint: sub your answer from d) into one of your equations)

$$W = 400 + 5(40) = 600 \text{ wins}$$

$$\text{OR } W = 520 + 2(40) = 600 \text{ wins.}$$

Practice Test: Solving Equations | MFM2P

On your unit test, I will be given you a mixture of level 3 problems to try, and I will mark you with a level. The following questions are a good representation of what you might see.

a) $(2x + 5) + 3x - 7 = 3x + 2$

$$\begin{array}{r} 5x - 2 = 3x + 2 \\ -3x \quad -3x \end{array}$$

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

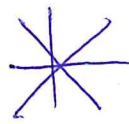
$$2x = 4$$

$$\boxed{x = 2}$$

b) $2(x - 1) + 3(x - 2) = 5x - 8$

$$(2x - 2) + (3x - 6) = 5x - 8$$

$$5x - 8 = 5x - 8 \quad (\text{always true})$$



Do not do this one. This equation is true no matter what value of x you try!

c) $\left(\frac{1}{5}x + 4 = \frac{1}{8}x + 13\right) \times 40$

$$\begin{array}{r} 8x + 160 = 5x + 520 \\ -5x \quad -5x \end{array}$$

$$\begin{array}{r} 3x + 160 = 520 \\ -160 \quad -160 \end{array}$$

$$\begin{array}{r} 3x = 360 \\ \underline{3} \quad \underline{3} \end{array}$$

$$\boxed{x = 120}$$

d) $3(x + 4) + 5(x - 3) = 2(x + 7) + 25$

$$(3x + 12) + (5x - 15) = 2x + 14 + 25$$

$$\begin{array}{r} 8x - 3 = 2x + 39 \\ -2x \quad -2x \end{array}$$

$$\begin{array}{r} 6x - 3 = 39 \\ +3 \quad +3 \end{array}$$

$$\begin{array}{r} 6x = 42 \\ \underline{6} \quad \underline{6} \end{array}$$

$$\boxed{x = 7}$$