

Name: Key
DISCRETE

Date: 5/11/18
TROICI

LESSON #7: VARIABLES ON BOTH SIDES/THE DISTRIBUTIVE PROPERTY

If variable terms appear on both sides of the equation, you must collect like variable terms on the same side of the equation and collect number terms on the other side.

Solve for x and check:

$$2x - 9 = 5x + 6$$

Step 1 - combine the #'s on one side

$$\begin{array}{r} 2x - 9 = 5x + 6 \\ + 9 \qquad + 9 \\ \hline \end{array}$$

Step 2 - combine the variables on the other

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

Step 3 - solve for x

$$\begin{array}{r} -3x = 15 \\ \frac{-3}{-3} \quad \frac{15}{-3} \\ \hline \boxed{x = -5} \end{array}$$

Directions: Solve for x and Check.

1) $x + 7 = 2x - 6$

$$\begin{array}{r} x + 7 = 2x - 6 \\ -7 \quad -7 \\ \hline x = 2x - 13 \\ -2x \quad -2x \\ \hline -1x = -13 \\ \frac{-1x}{-1} = \frac{-13}{-1} \\ \boxed{x = 13} \end{array}$$

2) $7x = 63 - 2x$ Check

$$\begin{array}{r} 7x = 63 - 2x \\ +2x \quad +2x \\ \hline 9x = 63 \\ \frac{9x}{9} = \frac{63}{9} \\ \boxed{x = 7} \end{array}$$

3) $4y = y + 30$

$$\begin{array}{r} 4y = y + 30 \\ -y \quad -y \\ \hline 3y = 30 \\ \frac{3y}{3} = \frac{30}{3} \\ \boxed{y = 10} \end{array}$$

4) $3b - 8 = 14 - 8b$ Check

$$\begin{array}{r} 3b - 8 = 14 - 8b \\ +8 \quad +8 \\ \hline 3b = 22 - 8b \\ +8b \quad +8b \\ \hline 11b = 22 \\ \frac{11b}{11} = \frac{22}{11} \\ \boxed{b = 2} \end{array}$$

PRACTICE:

Solve for each variable. Be sure to check your answer.

5) $7x = 10 + 2x$

$$\begin{array}{r} -2x \quad -2x \\ \hline 5x = 10 \\ \underline{5} \quad \underline{5} \end{array}$$

$$\boxed{x = 2}$$

6) $2\frac{1}{4}y = 1\frac{1}{4}y - 8$

$$\begin{array}{r} -1\frac{1}{4}y \quad -1\frac{1}{4}y \\ \hline 1y = -8 \\ \boxed{y = -8} \end{array}$$

Check

7) $.8m = .2m + 24$

$$\begin{array}{r} -.2m \quad -.2m \\ \hline .6m = 24 \\ \underline{.6} \quad \underline{.6} \\ \boxed{m = 40} \end{array}$$

8) $8y = 90 - 2y$

$$\begin{array}{r} +2y \quad +2y \\ \hline 10y = 90 \\ \underline{10} \quad \underline{10} \\ \boxed{y = 9} \end{array}$$

Check

9) $7r + 10 = 3r + 50$

$$\begin{array}{r} -3r \quad -3r \\ \hline 4r + 10 = 50 \\ \underline{-10} \quad \underline{-10} \\ 4r = 40 \\ \underline{4} \quad \underline{4} \\ \boxed{r = 10} \end{array}$$

10) $4y + 20 = 5y + 9$

$$\begin{array}{r} -4y \quad -4y \\ \hline 20 = y + 9 \\ \underline{-9} \quad \underline{-9} \\ \boxed{11 = y} \end{array}$$

Check

11) $2m - 1 = 6m + 1$

$$\begin{array}{r} +1 \quad +1 \\ \hline 2m = 6m + 2 \\ -6m \quad -6m \\ \hline -4m = 2 \\ \underline{-4} \quad \underline{-4} \\ \boxed{m = -\frac{1}{2}} \end{array}$$

12) $8a - 15 = 51 - 3a$

$$\begin{array}{r} +15 \quad +15 \\ \hline 8a = 66 - 3a \\ +3a \quad +3a \\ \hline 11a = 66 \\ \underline{11} \quad \underline{11} \\ \boxed{a = 6} \end{array}$$

Check

SOLVING EQUATIONS USING THE DISTRIBUTIVE PROPERTY

Directions: Simplify the following expressions.

$$1) \quad \begin{array}{r} 2(x-5) \\ \hline 2x-10 \end{array}$$

$$3) \quad \begin{array}{r} 5(a-2) \\ \hline 5a-10 \end{array}$$

$$5) \quad \begin{array}{r} -(5r+2) \\ \hline -5r-2 \end{array}$$

$$2) \quad \begin{array}{r} -4(w+4) \\ \hline -4w-16 \end{array}$$

$$4) \quad \begin{array}{r} 10-2(b+9) \\ 10-2b-18 \\ \hline -2b-8 \end{array}$$

$$6) \quad \begin{array}{r} -6(3q-1) \\ \hline -18q+6 \end{array}$$

SOLVING AN EQUATION WITH PARENTHESIS

If an equation has parenthesis, remove them by applying the distributive property.

ALWAYS DISTRIBUTE FIRST!

Directions: Solve for x and check.

$$7) \quad 3(x+5) = 18$$

$$\begin{array}{r} 3x+15=18 \\ -15 \quad -15 \\ \hline 3x=3 \end{array}$$

$$\begin{array}{r} 3x=3 \\ \hline 3 \quad 3 \\ \hline x=1 \end{array}$$

$$9) \quad -5(q+2) = -10$$

$$\begin{array}{r} -5q-10=-10 \\ +10 \quad +10 \\ \hline -5q=0 \end{array}$$

$$\begin{array}{r} -5q=0 \\ \hline -5 \quad -5 \\ \hline q=0 \end{array}$$

$$11) \quad 25 = 2(5x-5)$$

$$\begin{array}{r} 25=10x-10 \\ +10 \quad +10 \\ \hline 35=10x \end{array}$$

$$\begin{array}{r} 35=10x \\ \hline 10 \quad 10 \\ \hline x=3.5 \end{array}$$

$$8) \quad -2(x-4) = 6$$

$$\begin{array}{r} -2x+8=6 \\ -8 \quad -8 \\ \hline -2x=-2 \end{array}$$

$$\begin{array}{r} -2x=-2 \\ \hline -2 \quad -2 \\ \hline x=1 \end{array}$$

Check

$$10) \quad 3(2x-1) = 15$$

$$\begin{array}{r} 6x-3=15 \\ +3 \quad +3 \\ \hline 6x=18 \end{array}$$

$$\begin{array}{r} 6x=18 \\ \hline 6 \quad 6 \\ \hline x=3 \end{array}$$

Check

$$12) \quad 5(x+2) = -30$$

$$\begin{array}{r} 5x+10=-30 \\ -10 \quad -10 \\ \hline 5x=-40 \end{array}$$

$$\begin{array}{r} 5x=-40 \\ \hline 5 \quad 5 \\ \hline x=-8 \end{array}$$

Check

