

Name: *Key*

Date:

Topic:

Class:

Main Ideas/Questions	Notes/Examples		
Types of Solutions	Most equations we have solved so far have only one solution. However, there are two special cases : no solution and infinite solution. Solve the equations below to see what happens.		
	One Solution	No Solution	Infinite Solution
	$3(2x + 9) = -5 - 2x$ $\begin{array}{r} 6x + 27 = -5 - 2x \\ +2x \quad +2x \\ \hline 8x + 27 = -5 \\ -27 \quad -27 \\ \hline 8x = -32 \\ \frac{8x}{8} = \frac{-32}{8} \\ x = -4 \end{array}$	$7x - 9 - 3x = 4(x + 3) + 1$ $\begin{array}{r} 4x - 9 = 4x + 12 + 1 \\ 4x - 9 = 4x + 13 \\ -4x \quad -4x \\ \hline -9 = 13 \end{array}$ <p style="text-align: center;">No Solution</p>	$-2(3x - 5) = 2x + 10 - 8x$ $\begin{array}{r} -6x + 10 = 2x + 10 - 8x \\ -6x + 10 = -6x + 10 \\ +6x \quad +6x \\ \hline 10 = 10 \end{array}$ <p style="text-align: center;">Infinite</p>
<i>What does this mean?</i>	This is the ONLY SOLUTION that will make the equation true.	There is NO SOLUTION that will make the equation true. Symbol: \emptyset	ALL SOLUTIONS will make the equation true. Symbol: ∞
Examples	Directions: Solve each equation. Check all solutions.		
	1. $5x - 3 = 3(2x - 1) - x$ $\begin{array}{r} 5x - 3 = 6x - 3 - x \\ 5x - 3 = 5x - 3 \\ -5x \quad -5x \\ \hline -3 = -3 \end{array}$ <p style="text-align: center;">∞</p>	2. $2n - 5 = 9n + 37$ $\begin{array}{r} -2n \quad -2n \\ \hline -5 = 7n + 37 \\ -37 \quad -37 \\ \hline -42 = 7n \\ \frac{-42}{7} = \frac{7n}{7} \\ n = -6 \end{array}$	
	3. $2(4 - a) = -2(a - 8)$ $\begin{array}{r} 8 - 2a = -2a + 16 \\ +2a \quad +2a \\ \hline 8 = 16 \end{array}$ <p style="text-align: center;">\emptyset</p>	4. $4(2k - 3) + 1 = 8k - 11$ $\begin{array}{r} 8k - 12 + 1 = 8k - 11 \\ 8k - 11 = 8k - 11 \\ -8k \quad -8k \\ \hline -11 = -11 \end{array}$ <p style="text-align: center;">∞</p>	

5. $3(3c+5)+1=2(c-20)$

$$9c+15+1=2c-40$$

$$9c+16=2c-40$$
$$\begin{array}{r} -2c \\ -2c \end{array}$$

$$\begin{array}{r} 7c+16=-40 \\ -16 \quad -16 \\ \hline 7c=-56 \\ \frac{7c}{7} \quad \frac{-56}{7} \end{array}$$

$$c=-8$$

6. $3-(4w+5)=\frac{1}{2}(8w+28)$

$$3-4w-5=4w+14$$

$$\begin{array}{r} -4w-2=4w+14 \\ +4w \quad +4w \end{array}$$

$$\begin{array}{r} -2=8w+14 \\ -14 \quad -14 \\ \hline -16=8w \end{array}$$

$$\frac{-16}{8} = \frac{8w}{8}$$

$$w=-2$$

7. $-13+12p-4=6(2p-1)$

$$-13+12p-4=12p-6$$

$$\begin{array}{r} 12p-17=12p-6 \\ -12p \quad -12p \\ \hline -17=-6 \end{array}$$

$$-17 \neq -6$$

\emptyset

8. $-7(m-5)=4(4-m)+1$

$$-7m+35=16-4m+1$$

$$\begin{array}{r} -7m+35=-4m+17 \\ -17 \quad -17 \\ \hline -7m+18=-4m \end{array}$$

$$\begin{array}{r} -7m+18=-4m \\ +7m \quad +7m \\ \hline 18=3m \end{array}$$

$$\frac{18}{3} = \frac{3m}{3}$$

$$m=6$$

9. $2(8r+5)-3=4(4r-1)+11$

$$16r+10-3=16r-4+11$$

$$16r+7=16r+7$$

$$\begin{array}{r} -16r \quad -16r \\ \hline 7=7 \end{array}$$

$$7=7$$

∞

10. $12-4(2x+9)=-8(x+3)$

$$12-8x-36=-8x-24$$

$$\begin{array}{r} -8x-24=-8x-24 \\ +8x \quad +8x \\ \hline -24=-24 \end{array}$$

$$-24=-24$$

∞

11. $3(8k-3)=-6(7-4k)$

$$24k-9=-42+24k$$

$$\begin{array}{r} -24k \quad -24k \\ \hline -9 \neq -42 \end{array}$$

$$-9 \neq -42$$

\emptyset

12. $7v-(2v-16)=5(v+4)$

$$7v-2v+16=5v+20$$

$$\begin{array}{r} 5v+16=5v+20 \\ -5v \quad -5v \\ \hline 16 \neq 20 \end{array}$$

$$16 \neq 20$$

\emptyset