

# Lesson 12 ~ More on Equations

What happens when there are 2 variables in an equation?

Squish  
Combine (simplify) (clean algebra) and solve!

teacher  
tube

$$3a + 2 = 12 - 2a$$

$$\begin{array}{r|l} 3a + 2 & 12 \\ + 2a & \\ \hline 5a + 2 & 12 \\ 5a & 12 - 2 \\ & 10 \\ \hline & a = 2 \end{array}$$

$$3(c + 1) = 8 - c$$

$$\begin{array}{r} 3c + 3 = 8 - c \\ \phantom{3c} + 3 \phantom{=} \phantom{8} - \phantom{c} \\ \hline 3c = 8 - c - 3 \\ \phantom{3c} = 5 - c \\ \phantom{3c} + c = 5 - c + c \\ 3c + c = 5 \\ 4c = 5 \\ c = \frac{5}{4} \\ \hline c = 1.25 \end{array}$$

teacher  
tube

$$2b - 5 = 4b - 2$$

$$\begin{array}{r|l} 2b - 5 & -2 \\ - 4b & \\ \hline -2b - 5 & -2 \\ - 2b & -2 + 5 \\ \hline -2b & 3 \\ \hline & b = \frac{3}{2} \\ & b = 1.5 \end{array}$$

$$\frac{n + 2}{2} = 10 - \frac{n}{2}$$

$$\begin{array}{r|l} \frac{n + 2}{2} & 10 - \frac{n}{2} \\ \hline n + 2 & 20 - n \\ - n & \\ \hline 2 & 20 - n \\ \hline 2 & 20 - n \\ \hline n & 8 \\ n & = 8 \\ n & = 8 \end{array}$$

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Sec.2 Math Assignment**  
**Lesson 12**

Solve the following.

$$5x - 3 = 2x + 8$$

$$-5x - 3 = 2x + 8$$

$$6a + 3a + 7a = 144$$

$$x + x + 4 + x + 8 + x + 16 = 96$$

$$4x + 3 = 9x + 2$$

$$600 + 30x = 2000 - 20x$$

$$6(3x + 2) = 15$$

$$-3(2x + 5) = -6(2x - 12)$$

$$8(2x - 5) = 9(4x + 6)$$

$$\frac{3}{5}(10x - 20) = 50$$

9. Solve these equations. Show all work.

<p><b>a)</b> <math>10 - 4z = 14 + 8z</math></p>	<p><b>b)</b> <math>11 = \frac{n}{3} + 4</math></p>	<p><b>c)</b> <math>\frac{n}{4} + 3 = -5</math></p>
<p><b>d)</b> <math>\frac{3x+5}{2} = 7</math></p>	<p><b>e)</b> <math>3\frac{a}{4} + 5 = 11</math></p>	<p><b>f)</b> <math>2\frac{a}{3} - 7 = -12</math></p>
<p><b>g)</b> <math>4 - \frac{3s}{5} = -2</math></p>	<p><b>h)</b> <math>3(k-5) = 9</math></p>	<p><b>i)</b> <math>4(3-k) = 6</math></p>
<p><b>j)</b> <math>3r - 4(2r+4) = 0</math></p>	<p><b>k)</b> <math>4(p+3) = 3(p-2)</math></p>	<p><b>l)</b> <math>2(3p+2) = 18 - p</math></p>
<p><b>m)</b> <math>\frac{(4x+6)}{2} = 15</math></p>	<p><b>n)</b> <math>\frac{3(2x-1)}{5} + 1 = 10</math></p>	<p><b>o)</b> <math>0.3(2-3r) = 2.1r+6</math></p>
<p><b>p)</b> <math>5(2k-1) - 3(2-k) = 15</math></p>	<p><b>q)</b> <math>6(p-2) - 3(4-2p) = 2p+1</math></p>	

## Multi-Step Equations

Solve each equation.

1)  $-20 = -4x - 6x$

2)  $6 = 1 - 2n + 5$

3)  $8x - 2 = -9 + 7x$

4)  $a + 5 = -5a + 5$

5)  $4m - 4 = 4m$

6)  $p - 1 = 5p + 3p - 8$

7)  $5p - 14 = 8p + 4$

8)  $p - 4 = -9 + p$

9)  $-8 = -(x + 4)$

10)  $12 = -4(-6x - 3)$

11)  $14 = -(p - 8)$

12)  $-(7 - 4x) = 9$

13)  $-18 - 6k = 6(1 + 3k)$

14)  $5n + 34 = -2(1 - 7n)$

15)  $2(4x - 3) - 8 = 4 + 2x$

16)  $3n - 5 = -8(6 + 5n)$

17)  $-(1 + 7x) - 6(-7 - x) = 36$

18)  $-3(4x + 3) + 4(6x + 1) = 43$

19)  $24a - 22 = -4(1 - 6a)$

20)  $-5(1 - 5x) + 5(-8x - 2) = -4x - 8x$

## Two-Step Equations With Integers

Solve each equation.

1)  $\frac{r}{10} + 4 = 5$

2)  $\frac{n}{2} + 5 = 3$

3)  $3p - 2 = -29$

4)  $1 - r = -5$

5)  $\frac{k-10}{2} = -7$

6)  $\frac{n-5}{2} = 5$

7)  $-9 + \frac{n}{4} = -7$

8)  $\frac{9+m}{3} = 2$

9)  $\frac{-5+x}{22} = -1$

10)  $4n - 9 = -9$

11)  $\frac{x+9}{2} = 3$

12)  $\frac{-12+x}{11} = -3$

13)  $\frac{-4+x}{2} = 6$

14)  $-5 + \frac{n}{3} = 0$

$$15) \frac{p}{4} + 8 = 7$$

$$16) 9 + \frac{n}{4} = 15$$

$$17) 6 + \frac{x}{2} = 4$$

$$18) \frac{b+11}{3} = -2$$

$$19) \frac{a-10}{3} = -4$$

$$20) -12r + 4 = 100$$

$$21) \frac{m}{16} - 9 = -8$$

$$22) -7 + 4r = -15$$

$$23) \frac{m-13}{2} = -8$$

$$24) -5x + 13 = -17$$

$$25) \frac{k+10}{-2} = 5$$

$$26) \frac{p+8}{-2} = 10$$

$$27) -14r - 19 = 303$$

$$28) \frac{x}{-4} - 5 = -8$$

Multi-Step Equations

Solve each equation.

1)  $6a + 5a = -11$

2)  $-6n - 2n = 16$

3)  $4x + 6 + 3 = 17$

4)  $0 = -5n - 2n$

5)  $6r - 1 + 6r = 11$

6)  $r + 11 + 8r = 29$

7)  $-10 = -14v + 14v$

8)  $-10p + 9p = 12$

9)  $42 = 8m + 13m$

10)  $a - 2 + 3 = -2$

11)  $18 = 3(3x - 6)$

12)  $30 = -5(6n + 6)$

$$13) 37 = -3 + 5(x + 6)$$

$$14) -13 = 5(1 + 4m) - 2m$$

$$15) 4(-x + 4) = 12$$

$$16) -2 = -(n - 8)$$

$$17) -6(1 - 5v) = 54$$

$$18) 8 = 8v - 4(v + 8)$$

$$19) 10(1 + 3b) = -20$$

$$20) -5n - 8(1 + 7n) = -8$$

$$21) 8(4k - 4) = -5k - 32$$

$$22) -8(-8x - 6) = -6x - 22$$

$$23) 8(1 + 5x) + 5 = 13 + 5x$$

$$24) -11 - 5a = 6(5a + 4)$$

$$25) -5(4x - 2) = -2(3 + 6x)$$

$$26) 5(2x + 6) = -4(-5 - 2x) + 3x$$



## Combine the Variables

Multiply the number and variable inside each parentheses by the number in front of the parentheses. Then combine the like variables and solve the equation.

$$9x + 5(x + 7) = -49$$

$$9x + 5x + 35 = -49$$

$$14x + 35 = -49$$

$$14x + 35 - 35 = -49 - 35$$

$$\frac{14x}{14} = \frac{-84}{14}$$

$$x = -6$$

A.  $2b + 3(b - 7) = 44$

$2v + 3(8 - v) = -16$

$4(2y + 9) + 7y = -24$

$5(3n) + 14 + 6n = 21$

$5(n + 3) + 5 = -25$

$-8a + 6(a + 7) = 1$

$10z + 5(z - 12) = 0$

$7y + 7(y + 3) = -21$

$-3x + 6(x + 4) = 9$

$4z + 9 + 3(2z) = 129$

$6(3a - 2) + 5a = 57$