

Get out your homework from yesterday and start checking your answers.
Test on FRIDAY!

Classwork - Test Review (Word Problems)

1.) Simplifying Expressions Simplify the following expressions by combining like terms and using the distributive property.

A) $4(x + 2) + 7$
 $4x + 8 + 7$
 $4x + 15$

B) $-2(3x - 6) + 7x$
 $-6x + 12 + 7x$
 $x + 12$

C) $-3(5x + 3) - 5x$
 $-15x - 9 - 5x$
 $-20x - 9$

D) $8 - 2(2x - 4)$
 $8 - 4x + 8$
 $-4x + 16$

E) $4(3x - 6) + 3(-5x + 2)$
 $12x - 24 - 15x + 6$
 $-3x - 18$

F) $7 - 6(3x - 5) + 12x$
 $7 - 18x + 30 + 12x$
 $-6x + 37$

3) Solve the following equations. Simplify the equations BEFORE solving if needed. Make sure to show inverse operations on BOTH sides and WORK DOWN. SHOW ALL WORK.

$$\begin{array}{r} \text{A) } -90 = -12b + 30 \\ -30 \qquad -30 \\ \hline -120 = -12b \\ \frac{-120}{-12} = \frac{-12b}{-12} \\ 10 = b \end{array}$$

$$\begin{array}{r} \text{B) } \frac{3}{4}x + 8 = 2 \\ -8 \quad -8 \\ \hline 4 \cdot \frac{3x}{4} = -6 \cdot 4 \\ \frac{3x}{3} = \frac{-24}{3} \\ x = -8 \end{array}$$

$$\begin{array}{r} \text{C) } 52 = 4(-2x + 5) \\ 52 = -8x + 20 \\ -20 \quad -20 \\ \hline 32 = -8x \\ \frac{32}{-8} = \frac{-8x}{-8} \\ -4 = x \end{array}$$

$$\begin{array}{r} \text{D) } 72 = 4(2x + 6) \\ 72 = 8x + 24 \\ -24 \quad -24 \\ \hline 48 = 8x \\ \frac{48}{8} = \frac{8x}{8} \\ 6 = x \end{array}$$

$$\begin{array}{r} \text{E) } -3(2x + 1) = 63 \\ -6x - 3 = 63 \\ +3 \quad +3 \\ \hline -6x = 66 \\ \frac{-6x}{-6} = \frac{66}{-6} \\ x = -11 \end{array}$$

$$\begin{array}{r} \text{F) } 6(2x - 7) - 3x + 15 = 36 \\ 12x - 42 - 3x + 15 = 36 \\ 9x - 27 = 36 \\ +27 \quad +27 \\ \hline 9x = 63 \\ \frac{9x}{9} = \frac{63}{9} \\ x = 7 \end{array}$$

4) Solve the following equations. Make sure to COMPLETELY simplify BOTH the equations BEFORE solving. Make sure to show inverse operations on BOTH sides and WORK DOWN. SHOW ALL WORK

$$\begin{array}{r} \text{A) } 8x + 10 = 3x \\ -8x \quad -8x \\ \hline 10 = -5x \\ -5 \quad -5 \\ \hline -2 = x \end{array}$$

$$\begin{array}{r} \text{B) } 8a - 2 = 12 + a \\ -a \quad -a \\ \hline 7a - 2 = 12 \\ +2 \quad +2 \\ \hline 7a = 14 \\ \frac{7a}{7} = \frac{14}{7} \quad a = 2 \end{array}$$

$$\begin{array}{r} \text{C) } 7b - 4 = 2b + 16 \\ -2b \quad -2b \\ \hline 5b - 4 = 16 \\ +4 \quad +4 \\ \hline 5b = 20 \\ \frac{5b}{5} = \frac{20}{5} \quad b = 4 \end{array}$$

$$\begin{array}{r} \text{D) } 6x + 7 = 8x - 13 \\ -6x \quad -6x \\ \hline 7 = 2x - 13 \\ +13 \quad +13 \\ \hline 20 = 2x \\ \frac{20}{2} = \frac{2x}{2} \\ 10 = x \end{array}$$

$$\begin{array}{r} \text{E) } -4x - 3 = -6x + 9 \\ +6x \quad +6x \\ \hline 2x - 3 = 9 \\ +3 \quad +3 \\ \hline 2x = 12 \\ \frac{2x}{2} = \frac{12}{2} \\ x = 6 \end{array}$$

$$\begin{array}{r} \text{F) } 41 - 2n = 2 + 11n \\ +2n \quad +2n \\ \hline 41 = 2 + 13n \\ -2 \quad -2 \\ \hline 39 = 13n \\ \frac{39}{13} = \frac{13n}{13} \\ 3 = n \end{array}$$

The following equations could have one, infinite, or no solutions. Use the table below to help solve them.

One Solution	Infinite Solutions	No Solutions
$2x = -10$ $x = -5$	$3x + 5 = 3x + 5$ $5 = 5$	$6x - 3 = 6x + 4$ $-3 \neq 4$

G) $4(k-6) = 6(k+2)$

$$\begin{array}{r}
 4k - 24 = 6k + 12 \\
 -4k \quad -4k \\
 \hline
 -24 = 2k + 12 \\
 -12 \quad -12 \\
 \hline
 -36 = 2k \\
 \frac{-36}{2} = \frac{2k}{2} \\
 -18 = k
 \end{array}$$

H) $7w - 6 = 3(w + 6)$

$$\begin{array}{r}
 7w - 6 = 3w + 18 \\
 -3w \quad -3w \\
 \hline
 4w - 6 = 18 \\
 +6 \quad +6 \\
 \hline
 4w = 24 \\
 \frac{4}{4} \quad \frac{24}{4} \\
 w = 6
 \end{array}$$

I) $7(d-2) = 5(d+2)$

$$\begin{array}{r}
 7d - 14 = 5d + 10 \\
 -5d \quad -5d \\
 \hline
 2d - 14 = 10 \\
 +14 \quad +14 \\
 \hline
 2d = 24 \\
 \frac{2}{2} \quad \frac{24}{2} \\
 d = 12
 \end{array}$$

$$\begin{aligned}
 \text{J) } 2(12n - 11) &= -4(1 - 6n) \\
 24n - 22 &= -4 + 24n \\
 -24n &\quad -24n \\
 \hline
 -22 &\neq -4
 \end{aligned}$$

No Solutions

$$\begin{aligned}
 \text{K) } \frac{2}{3}(6x + 3) &= 3x + 2 + x \\
 4x + 2 &= 4x + 2 \\
 -4x &\quad -4x \\
 \hline
 2 &= 2
 \end{aligned}$$

Infinite Solutions

$$\begin{aligned}
 \text{L) } 5(2d + 4) &= 3(d - 5) \\
 10d + 20 &= 3d - 15 \\
 -3d &\quad -3d \\
 \hline
 7d + 20 &= -15 \\
 -20 &\quad -20 \\
 \hline
 7d &= -35 \\
 \frac{7d}{7} &= \frac{-35}{7}
 \end{aligned}$$

$$d = -5$$

$$\begin{aligned}
 \text{M) } 2(2n - 3) &= -6(n + 1) + 10n \\
 4n - 6 &= -6n - 6 + 10n \\
 4n - 6 &= 4n - 6 \\
 -4n &\quad -4n \\
 \hline
 -6 &= -6
 \end{aligned}$$

Infinite Solutions

$$\begin{aligned}
 \text{N) } -7(y + 9) &= 9(y - 5) - 14y \\
 -7y - 63 &= 9y - 45 - 14y \\
 -7y - 63 &= -5y - 45 \\
 +5y &\quad +5y \\
 \hline
 -2y - 63 &= -45 \\
 +63 &\quad +63 \\
 \hline
 -2y &= 18 \\
 \frac{-2y}{2} &= \frac{18}{2} \\
 y &= -9
 \end{aligned}$$

$$\begin{aligned}
 \text{O) } 8(h - 1) &= 6h + 4 + 2h \\
 8h - 8 &= 8h + 4 \\
 -8h &\quad -8h \\
 \hline
 -8 &= 4
 \end{aligned}$$

No Solutions

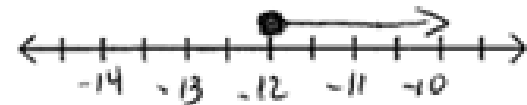
Solving Inequalities

5) Solve and graph the following inequalities. We use the same steps (inverse operations) to solve inequalities that we use when solving equations. **REMEMBER** → *When you multiply or divide both sides by a negative number when using inverse operations you flip the inequality sign!*

$$\begin{aligned} \text{A) } & 2(2x + 5) < 30 \\ & 4x + 10 < 30 \\ & \quad -10 \quad -10 \\ \hline & 4x < 20 \\ & \frac{4}{4} < \frac{20}{4} \\ & \textcircled{x < 5} \end{aligned}$$



$$\begin{aligned} \text{B) } & \frac{1}{3}(x - 12) \geq -8 \\ & \frac{1}{3}x - 4 \geq -8 \\ & \quad +4 \quad +4 \\ \hline & \frac{1}{3}x \geq -4 \\ & 3 \cdot \frac{1}{3}x \geq -4 \cdot 3 \\ & \textcircled{x \geq -12} \end{aligned}$$



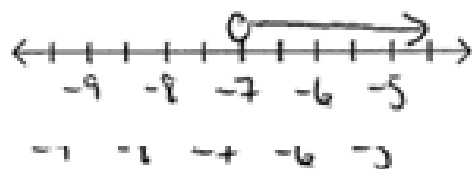
$$C) -29 < (-4x) - 8 + 7x$$

$$\begin{array}{r} -29 < 3x - 8 \\ +8 \quad +8 \end{array}$$

$$\frac{-21 < 3x}{3 \quad 3}$$

$$-7 < x$$

$$x > -7$$



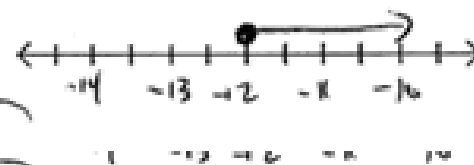
$$D) -5(x - 5) \leq 85$$

$$\begin{array}{r} -5x + 25 \leq 85 \\ -25 \quad -25 \end{array}$$

$$-5x \leq 60$$

$$\frac{-5x \leq 60}{-5 \quad -5 \text{ \&FIP}}$$

$$x \geq -12$$



$$E) 56 \geq -4(4x - 3) + 5x$$

$$56 \geq (-16x) + 12 + 5x$$

$$56 \geq -11x + 12$$

$$\begin{array}{r} 56 \geq -11x + 12 \\ -12 \quad -12 \end{array}$$

$$44 \geq -11x$$

$$\frac{44 \geq -11x}{-11 \quad -11 \text{ \&FIP}}$$

$$-4 \leq x$$

$$x \geq -4$$



$$F) \frac{2}{3}(12x - 21) + 7x - 8 \geq -112$$

$$(8x) - 14 + 7x - 8 \geq -112$$

$$15x - 22 \geq -112$$

$$\begin{array}{r} 15x - 22 \geq -112 \\ +22 \quad +22 \end{array}$$

$$15x \geq -90$$

$$\frac{15x \geq -90}{15 \quad 15}$$

$$x \geq -6$$



Write and solve an equation for the following situations. SHOW WORK

1) Erin has saved \$725 for a new guitar and lessons. Her guitar costs \$475, and guitar lessons are \$25 per hour. Determine how many hours of lessons she can afford.

Define Variable: h = # of hours

Equation

$$\begin{array}{r} 475 + 25h = 725 \\ -475 \qquad -475 \\ \hline 25h = 250 \\ \frac{25h}{25} = \frac{250}{25} \\ h = 10 \text{ hours} \end{array}$$

2) From the ground level to the tip of the torch, the Statue of Liberty and its pedestal are 92.99 meters tall. The pedestal is 0.89 meters taller than the statue. How tall is the Statue of Liberty?

Define Variable: n = height of the statue

Statue Ped. Equation

$$\begin{array}{r} n + (n + 0.89) = 92.99 \\ 2n + 0.89 = 92.99 \\ -0.89 \quad -0.89 \\ \hline 2n = 92.1 \\ \frac{2n}{2} = \frac{92.1}{2} \\ n = 46.05 \end{array}$$

3) Colby worked three more hours on Tuesday than he did on Monday. On Wednesday, he worked one hour more than twice the number of hours that he worked on Monday. If the total number of hours is two more than five times the number of hours worked on Monday, how many hours did he work on Monday?

Define Variable: h = hours on Monday

Equation

Mon	Tues	Wed	Total
h	$(h+3)$	$(1+2h)$	$= 2+5h$

$$h + (h+3) + (1+2h) = 2 + 5h$$

$$4h + 4 = 2 + 5h$$

$$-4h$$

$$-4h$$

$$4 = 2 + 1h$$

$$-2 \quad -2$$

$$2 = h$$

2 hours
on Monday

4) Deanna and Lisa are playing games at the arcade. Deanna started with \$15, and the machine she is playing costs \$0.75 per game. Lisa started with \$13, and her machine costs \$0.50 per game. After how many games will the two girls have the same amount of money remaining?

Define Variable: g = # of games

Deanna = Lisa

$$15 - 0.75g = 13 - 0.50g$$

$$15 - 0.25g = 13$$

$$-0.25g = -2$$

$$-0.25g \quad -0.25$$

$$g = 8 \text{ games}$$

5) The Wayside Hotel charges its guests \$1 plus \$0.80 per minute for long distance calls. Across the street, the Blue Sky Hotel charges its guests \$2 plus \$0.75 per minute for long distance calls. Find the length of a call for which the two hotels charge the same amount.

Equation

Define Variable: _____ = _____

6) Duke is a part-time student at Horizon Community College. He currently has 22 credits, and he plans to take 6 credits per semester until he is finished. Duke's friend Kila is also a student at the college. She has 4 credits and plans to take 12 credits per semester. After how many semesters will Duke and Kila have the same number of credits?

Define Variable: S = semesters

Equation
 $22 + 6s = 4 + 12s$