Trimester 1 Exam Review
Stations – Unit 1 & Multiple Choice – Unit 2

Name: Key

Station One

Write an algebra expression or equation to represent each verbal expression.

1. The sum of ten and a number. (+)

$10 + x$

2. The product of three and a number increased by seven

$3x + 7$

3. The quotient of a number and five is twenty. (÷ =)

$\frac{x}{5} = 20$

or

$x \div 5 = 20$

4. The sum of four times a number and two is eighteen.

$4x + 2 = 18$

Write a verbal expression for each algebraic expression.

Answers may vary.

5. $5m + 7$

The product of five and a number increased by seven

6. $x^2 - 8$

a number squared decreased by eight

7. $\frac{x}{8} = 2$

The quotient of a number and eight is two.

8. $2x + 3 = 8x - 9$

two times a number plus three is equal to eight times the same number minus nine

Evaluate each of the following expressions.

9. $3(4 + 36 \div 3^2)$ * Do not distribute!!

$3(4 + 36 \div 9)$

$3(4 + 4)$

$3(8)$

$\boxed{24}$

$x + y^3 - 5z$ if $x = 8, y = 2,$ and $z = 3$

$8 + 2^3 - 5(3)$

$8 + 8 - 15$

$16 - 15$

$\boxed{1}$

Station Two

Solve each of the following equations.

1. $8x - 2 = -9 + 7x$

$-7x \qquad -7x$

$x - 2 = -9$

$+2 \quad +2$

$\boxed{x = -7}$

2. $12 = -4(-6x - 3)$

$12 = 24x + 12$

$-12 \qquad -12$

$\frac{0}{24} = \frac{24x}{24}$

$\boxed{0 = x}$

3. $\frac{x}{4} - 9 = -12$

$+9 \quad +9$

$4 \cdot \frac{x}{4} = -3 \cdot 4$

$\boxed{x = -12}$

or $4\left(\frac{x}{4} - 9 = -12\right)$

$x - 36 = -48$

4. $2 \cdot \frac{x+3}{2} = 5 \cdot 2$

$x + 3 = 10$

$-3 \quad -3$

$\boxed{x = 7}$

5. $2(4x - 3) - 8 = 4 + 2x$

$8x - 6 - 8 = 4 + 2x$

$8x - 14 = 4 + 2x$

$-2x \qquad -2x$

$6x - 14 = 4$

$+14 \quad +14$

$6x = 18$

$\frac{6x}{6} = \frac{18}{6}$

$\boxed{x = 3}$

6. $5x + 34 = -2(1 - 7x)$

$5x + 34 = -2 + 14x$

$-5x \qquad -5x$

$34 = -2 + 9x$

$+2 \quad +2$

$\frac{36}{9} = \frac{9x}{9}$

$\boxed{4 = x}$

7. $-3(4x + 3) + 4(6x + 1) = 43$

$-12x - 9 + 24x + 4 = 43$

$12x - 5 = 43$

$+5 \quad +5$

$\frac{12x}{12} = \frac{48}{12}$

$\boxed{x = 4}$

8. $24a - 22 = -4(1 - 6a)$

$24a - 22 = -4 + 24a$

$-24a \qquad -24a$

$-22 = -4$ False

$\boxed{\text{No Solution}}$ same coefficients different constants

* if same coefficients, same constants → All real #s

9. $-5(1 - 5x) + 5(-8x - 2) = -4x - 8x$

$-5 + 25x - 40x - 10 = -12x$

$-5 - 15x - 10 = -12x$

$+15x \qquad +15x$

$-5 - 10 = 3x$

$\frac{-15}{3} = \frac{3x}{3}$

$\boxed{-5 = x}$

10. $-(1 + 7x) - 6(-7 - x) = 36$

$-1 - 7x + 42 + 6x = 36$

$-1x + 41 = 36$

$-41 \quad -41$

$\frac{-1x}{-1} = \frac{-5}{-1}$

$\boxed{x = 5}$

Station Three

Solve each of the following literal equation for the indicated variable.

1. $2x - 3y = 8$, solve for y

$-2x \quad -2x$

$\frac{-3y}{-3} = \frac{-2x+8}{-3}$

$\boxed{y = \frac{-2x+8}{-3}}$ or $\boxed{y = \frac{2}{3}x - \frac{8}{3}}$

2. $3 \cdot \frac{x+y}{3} = 5 \cdot 3$, solve for x

$x + y = 15$

$-y \quad -y$

$\boxed{x = 15 - y}$

3. $V = lwh$, solve for h

$\frac{V}{lw} = \frac{lwh}{lw}$

$\boxed{\frac{V}{lw} = h}$

4. $\frac{x}{4} - c = 8$, solve for x

$+c \quad +c$

$4\left(\frac{x}{4} = 8 + c\right)$

$\boxed{x = 4(8+c)}$ or $\boxed{x = 32 + 4c}$

5. $I \cdot R = \frac{E}{I} \cdot I$, solve for E

$\boxed{IR = E}$

6. $P = 2l + 2w$, solve for w

$-2l \quad -2l$

$\frac{P - 2l}{2} = \frac{2w}{2}$

$\boxed{\frac{P-2l}{2} = w}$ or $\boxed{\frac{P}{2} - l = w}$

7. $A = 3b + c$, solve for b

$-c \quad -c$

$\frac{A-c}{3} = \frac{3b}{3}$

$\boxed{\frac{A-c}{3} = b}$

8. $2 \cdot A = \frac{x+y}{2} \cdot 2$, solve for y

$2A = x + y$

$-x \quad -x$

$\boxed{2A - x = y}$

9. $y = 2x + 8$, solve for x

$-8 \quad -8$

$\frac{y-8}{2} = \frac{2x}{2}$

$\boxed{\frac{y-8}{2} = x}$ or $\boxed{\frac{y}{2} - 4 = x}$

10. $V = \pi r^2 h$, solve for h

$\frac{V}{\pi r^2} = \frac{\pi r^2 h}{\pi r^2}$

$\boxed{\frac{V}{\pi r^2} = h}$

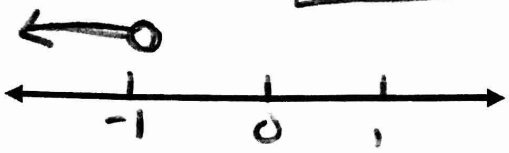
★ = compound ineq. **Station Four**

Solve and **Graph** each of the following inequalities.

1. $3 < -5n + 2n$

Flip! $\frac{3}{-3} < \frac{-3n}{-3}$

$\boxed{-1 > n}$ or $\boxed{n < -1}$

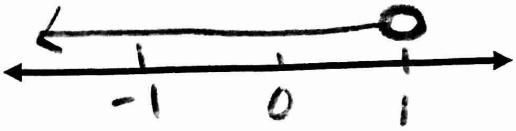


2. $6x + 2 + 6x < 14$

$12x + 2 < 14$

$-2 \quad -2$

$\frac{12x}{12} < \frac{12}{12}$ $\boxed{x < 1}$



3. $5(6 + 3r) + 7 \geq 127$

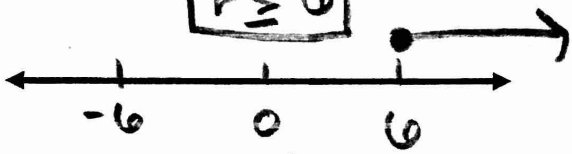
$30 + 15r + 7 \geq 127$

$37 + 15r \geq 127$

$-37 \quad -37$

$\frac{15r}{15} \geq \frac{90}{15}$

$\boxed{r \geq 6}$



4. $3(1 - 2x) > 3 - 6x$

$3 - 6x > 3 - 6x$

$+6x \quad +6x$

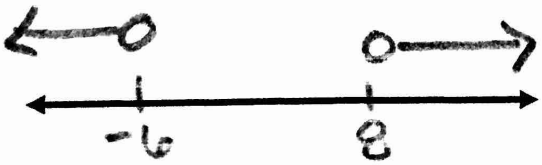
$3 > 3$ False

$\emptyset$ no solution no graph

★ $m - 2 < -8$ or $\frac{m}{8} > 1$

$+2 \quad +2$

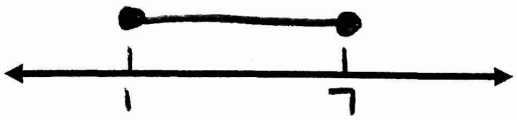
$\boxed{m < -6 \text{ or } m > 8}$



★ $x + 8 \geq 9$ and $\frac{x}{7} \leq 1$

$-8 \quad -8$

$\boxed{x \geq 1 \text{ and } x \leq 7}$

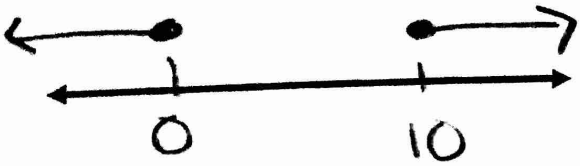


★ $7x - 5 \geq 65$ or $-3x - 2 \geq -2$

$+5 \quad +5 \qquad +2 \quad +2$

$\frac{7x}{7} \geq \frac{70}{7} \qquad \frac{-3x}{-3} \geq \frac{0}{3}$ Flip!

$\boxed{x \geq 10 \text{ or } x \leq 0}$

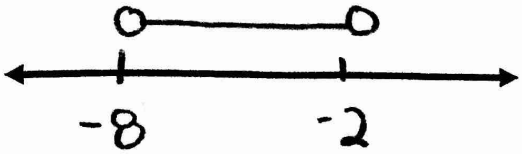


★ $-50 < 7x + 6 < -8$

$-6 \quad -6 \quad -6$

$\frac{-56}{7} < \frac{7x}{7} < \frac{-14}{7}$

$\boxed{-8 < x < -2}$



Station Five

Solve each of the following Absolute Value Equations. *HINT* you should typically have 2 solutions.

1. $|x - 10| = 3$

$x - 10 = 3$
$+10 \quad +10$
$\boxed{x = 13}$

$x - 10 = -3$
$+10 \quad +10$
$\boxed{x = 7}$

2. $|2x + 9| = 15$

$2x + 9 = 15$
$-9 \quad -9$
$\frac{2x}{2} = \frac{6}{2}$
$\boxed{x = 3}$

$2x + 9 = -15$
$-9 \quad -9$
$\frac{2x}{2} = \frac{-24}{2}$
$\boxed{x = -12}$

3. $\left|\frac{x}{7}\right| = 3$

$7 \cdot \frac{x}{7} = 3 \cdot 7$
$\boxed{x = 21}$

$\frac{x}{7} = -3$
$\boxed{x = -21}$

4. $|x + 3| = -2$

cannot have negative distance

$\boxed{\emptyset}$

5. $|3x + 6| = 18$

$3x + 6 = 18$
$-6 \quad -6$
$\frac{3x}{3} = \frac{12}{3}$
$\boxed{x = 4}$

$3x + 6 = -18$
$-6 \quad -6$
$\frac{3x}{3} = \frac{-24}{3}$
$\boxed{x = -8}$

6. $|4x - 5| = 15$

$4x - 5 = 15$
$+5 \quad +5$
$\frac{4x}{4} = \frac{20}{4}$
$\boxed{x = 5}$

$4x - 5 = -15$
$+5 \quad +5$
$\frac{4x}{4} = \frac{-10}{4}$
$\boxed{x = \frac{-5}{2}}$

★ $\frac{4|x + 8|}{4} = \frac{56}{4}$

$|x + 8| = 14$

$x + 8 = 14$
$-8 \quad -8$
$\boxed{x = 6}$

$x + 8 = -14$
$-8 \quad -8$
$\boxed{x = -22}$

★ $8 \cdot \frac{|x-5|}{8} = 2 \cdot 8$

$|x - 5| = 16$

$x - 5 = 16$
$+5 \quad +5$
$\boxed{x = 21}$

$x - 5 = -16$
$+5 \quad +5$
$\boxed{x = -11}$

★ isolate | | first, then 2 cases

less THAND
GreatOR than

Station Six

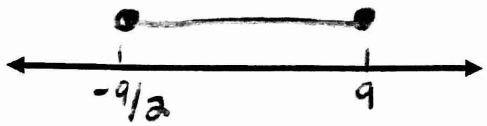
Solve and Graph each of the following absolute value inequalities.
***Remember to determine if it's an AND or OR inequality**

AND

1. $|4x - 9| \leq 27$

$4x - 9 \leq 27$ $\quad$ $4x - 9 \geq -27$
$+9 \quad +9$ $\quad$ $+9 \quad +9$
$\frac{4x}{4} \leq \frac{36}{4}$ $\quad$ $\frac{4x}{4} \geq \frac{-18}{4}$

$\boxed{x \leq 9 \text{ and } x \geq \frac{-9}{2}}$

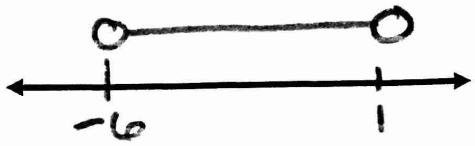


And

2. $|10 + 4x| < 14$

$10 + 4x < 14$ $\quad$ $10 + 4x > -14$
$-10 \quad -10$ $\quad$ $-10 \quad -10$
$\frac{4x}{4} < \frac{4}{4}$ $\quad$ $\frac{4x}{4} > \frac{-24}{4}$

$\boxed{x < 1 \text{ and } x > -6}$

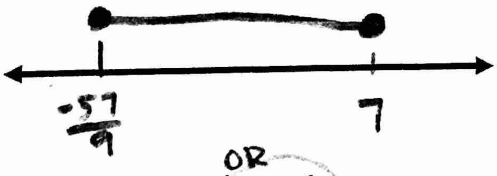


AND

3. $|3 - 9a| \leq 60$

$3 - 9a \leq 60$ $\quad$ $3 - 9a \geq -60$
$-3 \quad -3$ $\quad$ $-3 \quad -3$
Flip! $\frac{-9a}{-9} \leq \frac{57}{-9}$ $\quad$ $\frac{-9a}{-9} \geq \frac{-63}{-9}$

$\boxed{a \geq \frac{57}{-9} \text{ and } a \leq 7}$

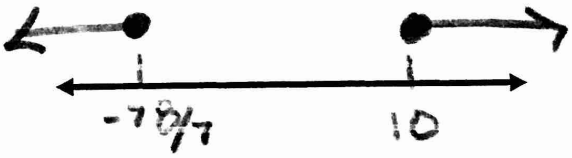


OR

4. $|7x + 4| \geq 74$

$7x + 4 \geq 74$ or $7x + 4 \leq -74$
$-4 \quad -4$ $\quad$ $-4 \quad -4$
$\frac{7x}{7} \geq \frac{70}{7}$ $\quad$ $\frac{7x}{7} \leq \frac{-78}{7}$

$x \geq 10$ or $x \leq \frac{-78}{7}$



OR

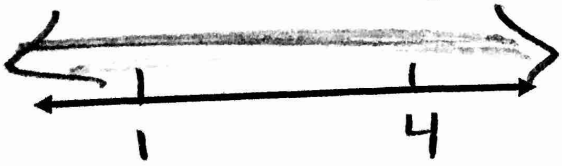
5. $|4x - 10| > -6$

Always greater than -6

$4x - 10 > -6$ $\quad$ $4x - 10 < 6$
$+10 \quad +10$ $\quad$ $+10 \quad +10$
$\frac{4x}{4} > \frac{4}{4}$ $\quad$ $\frac{4x}{4} < \frac{16}{4}$

$x > 1$ or $x < 4$

$\boxed{\mathbb{R}}$



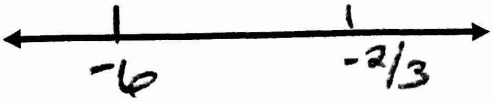
6. $|3x + 10| < -8$

cannot be less than negative distance

$3x + 10 < -8$ $\quad$ $3x + 10 > 8$
$-10 \quad -10$ $\quad$ $-10 \quad -10$
$\frac{3x}{3} < \frac{-18}{3}$ $\quad$ $\frac{3x}{3} > \frac{-2}{3}$

$x < -6$ $\quad$ $x > \frac{-2}{3}$

$\boxed{\emptyset}$



Station Seven

Solve each of the following application problems. *Remember to define your variable, set up an equation inequality, solve, and write a sentence to explain your answer.

1. Sara bought a soft drink for $4 and 8 candy bars. She spent a total of $44. How much did each candy bar cost?

X= cost of candy bar

$4 + 8x = 44$ $x=5$

$-4 \quad -4$

$\frac{8x}{8} = \frac{46}{8}$

Candy bars cost $5.00

2. On Monday, 418 students went on a trip to the zoo. All 9 buses were filled and 4 students had to travel in cars. How many students were in each bus?

X= # of students in bus

$9x + 4 = 418$

$-4 \quad -4$

$\frac{9x}{9} = \frac{414}{9}$

$x = 46$

46 students were in each bus

3. Oceanside Bike Rental Shop charges $15 to rent the bike, and $8 per hour you rent the bike. Mary paid $87 to rent a bike. How many hours did she pay to have the bike checked out?

X= # of hours for bike

$15 + 8x = 87$ $x=9$

$-15 \quad -15$

$\frac{8x}{8} = \frac{72}{8}$

9 hours were spent with bike checked out

4. You want to rent a limousine for prom. The limo costs $700 for the night and $0.15 per mile. If you want to spend no more than $750, how many miles can you travel to prom?

$\leq$

=# of miles

$700 + .15x \leq 750$

$-700 \quad -700$

$\frac{.15x}{.15} \leq \frac{50}{.15}$

$x \leq 333\frac{1}{3}$

You can travel no more than 333 miles

5. Chris wants to order DVDs online. Each DVD costs $12.99 and if you spend at least $50, you get free shipping. How many DVDs does he need to purchase in order to get free shipping?

$\geq$

X=# of DVDs

$\frac{12.99x}{12.99} \geq \frac{50}{12.99}$

$x \geq 3.849...$

You need to purchase at least 4 DVDs

6. Skate Land charges a $50 fee for a birthday party and $5.50 per person who attends the party. Joann can spend a maximum of $100, how many people can she invite to her party?

X= # of people

$50 + 5.50x \leq 100$

$-50 \quad -50$

$\frac{5.50x}{5.5} \leq \frac{50}{5.5}$

$x \leq 9.09...$

You can invite 9 people at max.

Unit 2 Multiple Choice Practice

1. What is the slope of the line that passes through the points (2,5) and (7,3)?
   A. $-\frac{5}{2}$
   B. $-\frac{2}{5}$
   C. $\frac{8}{9}$
   D. $\frac{9}{8}$

   $\frac{3-5}{7-2} = \frac{-2}{5}$

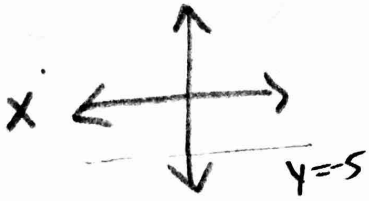
2. What is the slope of the line that passes through the points $(-6,1)$ and $(-6,-4)$?
   A. *undefined*
   B. 0
   C. $\frac{12}{5}$
   D. $\frac{5}{12}$

   $\frac{-4-1}{-6--6} = \frac{-5}{0}$

3. What is the slope of the line containing the points (3,4) and $(-6,4)$?
   A. *undefined*
   B. 0
   C. $-\frac{8}{9}$
   D. $\frac{8}{9}$

   $\frac{4-4}{-6-3} = \frac{0}{-9}$

4. Which equation represents a line parallel to the x – axis?
   A. $y = -5$
   ~~B. $y = -5x$~~
   C. $x = 3$
   ~~D. $x = 3y$~~



5. Which equation represents a line that is perpendicular to the line whose equation is $y = -3x - 7$?
   A. $y = -3x + 4$
   B. $y = -\frac{1}{3}x - 7$
   C. $y = \frac{1}{3}x + 5$
   D. $y = 3x - 2$

   $m = -3$
   $\downarrow$
   $m = \frac{1}{3}$

   Opposite reciprocal

6. What is the slope of line represented by the equation $3y + 2x = 8$?
   A. $\frac{2}{3}$
   B. -2
   C. 2
   D. $-\frac{2}{3}$

   $3y + 2x = 8$
   $-2x \quad -2x$
   $\frac{3y}{3} = \frac{-2x}{3} + \frac{8}{3}$
   $y = \frac{-2x}{3} + 8/3$

7. Which equation represents a line that is parallel to the line whose equation is $2x - 3y = 9$?
   A. $y = \frac{2}{3}x - 4$
   B. $y = -\frac{2}{3}x + 4$
   C. $y = \frac{3}{2}x - 4$
   D. $y = -\frac{3}{2}x + 4$

   $-2x \quad -2x$
   $\frac{-3y}{-3} = \frac{-2x}{-3} + \frac{9}{-3}$
   $y = \frac{2}{3}x - 3$

8. Which set of coordinates is a solution of the equation $2x - y = 11$
   ~~A.~~ $(-6,1)$
   ~~B.~~ $(-1,9)$
   ~~C.~~ $(0,11)$
   D. $(2,-7)$

9. What is the y-intercept of the line represented by the equation $4x + 3y = 12$
   A. (0,3)
   B. (3,0)
   C. (4,0)
   D. (0,4)

   $3y = 12$
   $y = 4$
   $(0,4)$