Algebra II – Mrs. Tilus
Unit 1 Review

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1. Solve each equation and show your steps.

a.) $0.3(2x-3) = 0.2x + 0.9$

$0.6x - 0.9 = 0.2x + 0.9$
$-0.2x \quad\quad -0.2x$
$0.4x - 0.9 = 0.9$
$+0.9 \quad +0.9$
$\frac{0.4x}{0.4} = \frac{1.8}{0.4}$
$x = 4.5$

b.) $3(4x+3) = 4(3x-2) + 6$

$12x + 9 = 12x - 8 + 6$
$12x + 9 = 12x - 2$
$-12x \quad\quad -12x$
$9 = -2$ (False)

No Solution: $\emptyset$

c.) $2x - (x-4) = 6x + 14$

$2x - x + 4 = 6x + 14$
$x + 4 = 6x + 14$
$-x \quad\quad -x$
$4 = 5x + 14$
$-14 \quad\quad -14$
$\frac{-10}{5} = \frac{5x}{5}$
$x = -2$

2. Match each term/symbol with the appropriate definition or example.

A. Example of an equation	A value that makes an equation or inequality true.	F.
B. Example of an expression	A number in front of a variable.	I.
C. Example of an inequality	Two inequalities joined by the word "or". It is true when at least one of the solutions is satisfied.	E
D. Conjunction	Tells us how many times to multiply a number or variable by itself.	J.
E. Disjunction	$3x + 7$	B.
F. Solution/Root	When no value of x will make the equation a true statement, the solution set is _____	G.
G. $\{\emptyset\}$	$9b - 3z = 4$	A.
H. $\{\mathbb{R}\}$	$3 < 8$	C.
I. Coefficient	When an equation is true for all values and is therefore an identity, the solution set is _____ Infinite Solutions	H.
J. Exponent	Two inequalities joined by the idea "and". It is true when both solutions of an open sentence are satisfied.	D.

3. Answer True/False.

a.) If $a > b$ *and* c *is positive then* $ac > bc$ 3a.) True

b.) If $a > b$ *and* c *is negative then* $ac > bc$ 3b.) False

c.) $|n| + 7 = 5$ $|n| \neq -2$ 3c.) False

d.) $|3x - 7| \geq 5$ is a conjunction. 3d.) False

Disjunction

e.) The solution to $|2x + 4| = 10$ is {x: x = 3 or x = -3} 3e.) False

d) $-5 \geq 3x - 7 \geq 5$
$+7 \quad +7 \quad +7$
$2 \geq 3x \geq 12$
$\frac{2}{3} \geq x \geq 4$

e.) $|2(3)+4| = |6+4| = |10| = 10$ ✓
$|2(-3)+4| = |-6+4| = |-2| = 2$ ✗

4. Solve the following formula for h.

a.) $(V) = \left(\frac{1}{3}\pi r^2 h\right)3 \Rightarrow \frac{3V}{\pi r^2} = \frac{\pi r^2 h}{\pi r^2}$

$\frac{3V}{\pi r^2} = h$

b.) $-3d - 6h = 24$
$+3d \quad +3d$
$\frac{-6h}{-6} = \frac{3d - 24}{-6}$
$h = -\frac{1}{2}d + 4$

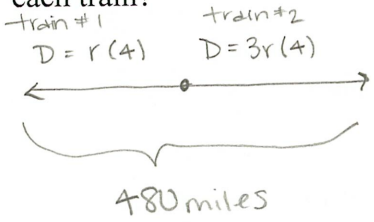
5. Represent each word phrase by an algebraic expression.

a.) Two less than five times a number. 5a.) $5n - 2$

b.) Four times the sum of a number and three. 5b.) $4(n+3)$

c.) The quotient when eight is divided by twice a number. 5c.) $8 \div 2n$

6. At noon, two trains leave the same station, and they are traveling in opposite directions. One train is traveling at three times the speed of the other train. At 4:00pm they are 480 miles apart. What is the rate of each train?



Total Distance = Dist. train #1 + Dist train #2
(rate x time) (rate x time)

$480 = r(4) + 3r(4)$

$480 = 4r + 12r$

$\frac{480}{16} = \frac{16r}{16}$

$30 = r$

Train #1 = 30 mph

Train #2 = 90 mph

7. Hank has 35 coins consisting of nickels and dimes with a total value of \$2.75. How many of each kind of coin are there?

Total Amount = \$ nickels + \$ dimes
(value x #) (value x #)

nickels = n

dimes = 35 - n

$2.75 = 0.05n + 0.10(35 - n)$

$2.75 = 0.05n + 3.5 - 0.10n$

$2.75 = 3.5 - 0.05n$

$-3.5 \quad -3.5$

$\frac{-0.75}{-0.05} = \frac{-0.05n}{-0.05}$

$15 = n$

Nickels = 15

Dimes = 20

8. Solve and graph each inequality.

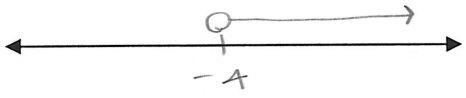
a.) $3 - 2x < 11$

$-3 \quad -3$

$-2x < 8$

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

$x > -4$



b.) $5x + 3 > 5(x + 2) - x$

$5x + 3 > 5x + 10 - x$

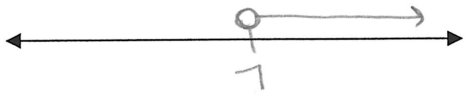
$5x + 3 > 4x + 10$

$-4x \quad -4x$

$x + 3 > 10$

$-3 \quad -3$

$x > 7$



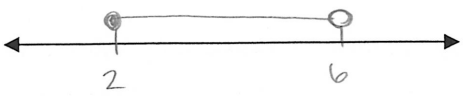
9. Solve and graph each compound inequality.

a.) $-1 \leq 2x - 5 < 7$

$+5 \quad +5 \quad +5$

$\frac{4}{2} \leq \frac{2x}{2} < \frac{12}{2}$

$2 \leq x < 6$



b.) $5 + 3x \leq 2$ or $2x - 2 > 4 - x$

$-5 \quad -5 \qquad +x \quad +x$

$\frac{3x}{3} \leq \frac{-3}{3}$

$x \leq -1$

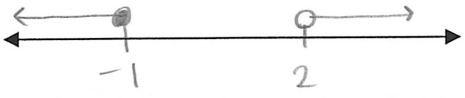
$3x - 2 > 4$

$+2 \quad +2$

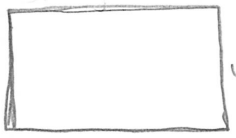
$\frac{3x}{3} > \frac{6}{3}$

$x > 2$

$x \leq -1$ or $x > 2$



10. The length of a rectangle is 5 cm more than twice its width. Find the possible widths if the perimeter is at most 64 cm.



$P = l + w + l + w$

$64 \geq 2w + 5 + w + 2w + 5 + w$

$64 \geq 6w + 10$

$-10 \quad -10$

$54 \geq 6w$

$\frac{54}{6} \geq \frac{6w}{6}$

$9 \geq w$

The width would need to be 9cm or less

11. Solve and graph each absolute value inequality.

a.) $|w + 5| + 3 \geq 13$

$-3 \quad -3$

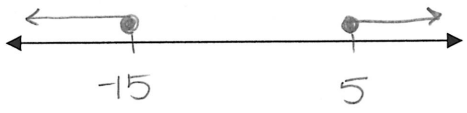
$|w+5| \geq 10$ ← Disjunction

opposite, same

$-10 \geq w + 5 \geq 10$

$-5 \quad -5 \quad -5$

$-15 \geq w \geq 5$



$w \leq -15$ OR $w \geq 5$

b.) $|x + 2| < 3$ ← Conjunction

opposite, same

$-3 < x + 2 < 3$

$-2 \quad -2$

-2

$-5 < x < 1$