10. Integrated Algebra Unit 1 Test Review

Name: Key

Solve. Show all work. Don't forget, onlookers __________!

1

1. $\frac{3x-5}{5}+6=1$

$-6 \quad -6$

$\frac{3x-5}{5}=-5$

$3x-5=-25$

$3x=-20$

$x=-20/3$

2. $3 \cdot \left[\frac{2}{3}(12x-3)\right]=\left[x+2\right] \cdot 3$

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

$24x-6=3x+6$

$21x=12$

$x=\frac{12}{21}=\frac{4}{7}$

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

$8x=5(x-3)$

$8x=5x-15$

$3x=-15$

$x=-5$

4. $5-2(3x-1)=7-6x$

$5-6x+2=7-6x$

$-6x+7=7-6x$

$0=0$

many solutions

5. $12 \cdot \left[\frac{3x}{4}-\frac{2}{3}\right]=\left[\frac{x}{3}+4\right] \cdot 12$

$9x-8=4x+48$

$5x=56$

$x=\frac{56}{5}$

6. $10-2(x-3)=2(6-x)$

$10-2x+6=12-2x$

$16-2x=12-2x$

$16=12$

no solutions

7. Solve $V = LWH$ for H

$$\frac{V}{LW} = \frac{LWH}{LW}$$

$$H = \frac{V}{LW}$$

8. Solve for y: $xy + c = d$

$$xy = d - c$$

$$y = \frac{d-c}{x}$$

9. Solve $A = \frac{1}{3}x(a+b)$ for a

$$\frac{3A}{x} = \frac{\cancel{x}(a+b)}{\cancel{x}}$$

$$\frac{3A}{x} = a + b$$

$$\frac{3A}{x} - b = a$$

10. Solve $xy \cdot C = \frac{a}{xy} \cdot xy$ for y

$$\frac{Cxy}{Cx} = \frac{a}{Cx}$$

$$y = \frac{a}{Cx}$$

11. Is 3 a solution of $-2x + 3 > 0$? PROVE IT!

$$-2(3) + 3 > 0$$

$$-6 + 3 > 0$$

$$-3 > 0$$

false $\therefore \boxed{\text{no}}$

12. Solve and sketch the graph of $20 + 5b \geq 2(3b - 4)$

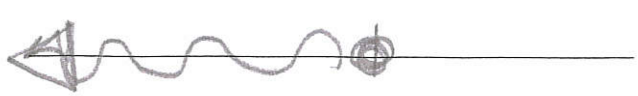
$$20 + 5b \geq 6b - 8$$

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

$$20 - b \geq -8$$

$$-b \geq -28$$

$$b \leq 28$$



28

Interval Notation: $(-\infty, 28]$

$-2 < x < 2$ 3

Solve and graph the solution set and state in interval notation.

13. $3 \cdot -\frac{2}{3}x > 8 \cdot 3$

$-2x > 24$

$\frac{-2x}{-2} \quad \frac{24}{-2}$

$x < -12$

-12

$(-\infty, -12)$

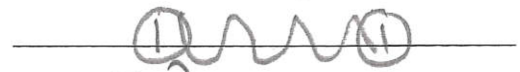
14. $-1 < -2x + 3 < 7$

$-3 \quad -3 \quad -3$

$-4 < -2x < 4$

$\frac{-4}{-2} \quad \frac{-2x}{-2} \quad \frac{4}{-2}$

$2 > x > -2$



$-2 \quad 2$

$(-2, 2)$

15. $2x - 4 < 0$ or $2 \cdot \frac{1}{2}x > 5 \cdot 2$

$2x < 4$ or

$x < 2$ $\quad$ $x > 10$

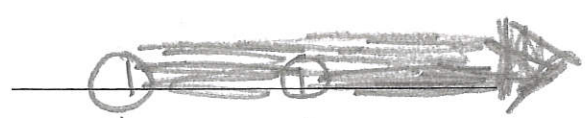
$2 \quad 10$

$(-\infty, 2) \cup (10, \infty)$

16. $-2x + 3 < 5$ OR $3 \cdot \frac{2}{3}x > -4 \cdot 3$

$-2x < 2$ $\quad$ $2x > -12$

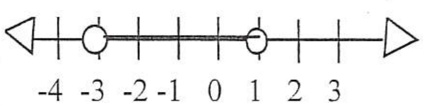
$x > -1$ or $x > -6$



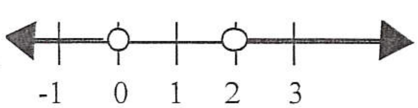
$-6 \quad -1$

$(-6, \infty)$

Write a compound inequality for each solution set shown below in set or interval notation.

17. 

$(-3, 1)$

18. 

$(-\infty, 0) \cup (2, \infty)$

4

19. Solve $2|x| = 8$

Ans: $x = 4$ or $x = -4$

$|x| = 4$

$x = 4$ OR $x = -4$

20. Solve: $-4|2x+7|-4=16$

$+4 \quad +4$

$-4|2x+7| = 20$

$\div -4 \qquad \div -4$

$|2x+7| = -5$

$| \, | \neq$ neg

Ans: no solution

21. Solve: $|2x-8|-4=2$

$|2x-8| = 6$

$2x-8=6$ | $2x-8=-6$

$2x=14$ | $2x=2$

$x=7$ OR $x=1$

Ans: $x = 7$ or $x = 1$

22. $\frac{1}{2}|2x-3|-9=3$ Ans: ______________

$+9 \quad +9$

$\boxed{2} \cdot \frac{1}{2}|2x-3| = 12 \boxed{\cdot 2}$

$|2x-3| = 24$

$2x-3=24$ OR

$2x=27$

$x = \frac{27}{2}$

$2x-3=-24$

$2x=-21$

OR $x = \frac{-21}{2}$

23. I'm thinking of a number. 3 less than twice the number is the same as 4 more than 3 times the number. What is the number?

$2n-3 = 3n+4$

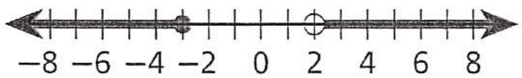
$-7 = n$

Ans: -7

10. **Solving COMPOUND Inequalities REVIEW** Key

Compound Inequalities

- A **disjunction** is a compound statement that uses the word *or*.



$x \le -3$ **OR** $x > 2$

Set builder notation: $\{x / x \le -3$ OR $x > 2\}$

Interval notation: $(-\infty,-2]$ **OR** $(2, \infty)$

- A **conjunction** is a compound statement that uses the word *and*.

$x \ge -3$ **AND** $x < 2$ (or $-3 \le x < 2$)

Set builder notation: $\{x | x \ge -3$ **AND** $x < 2\}$ or $\{x | -3 \le x < 2\}$

Interval notation: $[-3,2)$

To **solve compound inequalities**, solve each inequality and graph the solution.

Examples: Solve and describe the solution in interval notation.

1. $9x < 54$ and $-4x < 12$

$x < 6$ and $x > -3$

$-3 < x < 6$

$(-3, 6)$

2. $6(x + 2) \ge 24$ or $5x + 10 \le 15$

$x + 2 \ge 4$ $\quad 5x \le 5$

$x \ge 2$ OR $x \le 1$

1 2

$(-\infty, 1] \cup [2, \infty)$

3. $3x - 5 \ge -8$ and $3x - 5 \le 1$

$3x \ge -3$ $\quad 3x \le 6$

$x \ge -1$ & $x \le 2$

$-1 \le x \le 2$

$[-1, 2]$

4. $x - 5 < -2$ or $-2x \le -10$

$x < 3$ or $x \ge 5$

3 5

$(-\infty, 3) \cup [5, \infty)$

5. $-6 < -2x + 4 < 10$

$$\begin{array}{ccccc} -6 & < & -2x+4 & < & 10 \\ -4 & & -4 & & -4 \\ \hline -10 & < & -2x & < & 6 \\ \overline{-2} & & \overline{-2} & & \overline{-2} \end{array}$$

$5 > x > -3$

$-3 < x < 5$ $\quad (-3, 5)$

6. $-2x + 5 > 9$ OR $5 - x < 8$

$-2x > 4$ $\quad -x < 3$

$x < -2$ $\quad x > -3$

−3 −2

$\mathbb{R}$

Honors Algebra 2 Notes Name ______________________

1.7 Solve Absolute Value Equations and Inequalities Day 1

Absolute Value is the distance **from zero on a # line.**	
$\|5\|$ **means move 5 units to the right of 0.** **The distance is** 5 units.	$\|-5\|$ **means** **The distance is** pos.
$\|16\|$ **means** **The distance is** pos.	$\|-16\|$ **means** **The distance is** pos.
$\|x\| = 10$ $x = 10$ $x = -10$	

Important tips to remember when solving an Absolute Value Equation:

1. Treat the absolute value bars as a grouping symbol... **BUT NEVER** Distribute into them!!!
2. **Isolate** the absolute value bars to solve.
3. Remember: the value inside can be positive or negative. **2 cases!!!**
4. **Check** final answers for **Extraneous Values!!!** SUBSTITUTE BACK INTO THE **ORIGINAL** EQUATION!! **EVALUATE (apply)** the absolute value.

1. $\|x + 6\| = 9$ $x+6=9$ or $x+6=-9$ $x=3$ or $x=-15$	**2.** $4\|3x - 5\| = 8x$
3. $\|x - 3\| + 7 = 2$ $-7 \quad -7$ $\|x-3\| = -5$ no solution $\|\,\| \neq$ neg!	**4.** $\frac{1}{2}\|x - 2\| + 3 = x - 2$

1.4 Rewrite Formulas & Equations

Formula: an equation that relates two or more quantities:

Examples:

$D = R \bullet T$
Solve for time
$\boxed{\frac{D}{R} = T}$

$A_{rectangle} = lw$
Solve for length
$\boxed{\frac{A}{w} = l}$

$A_{circle} = \pi r^2$
Solve for radius
$\frac{A}{\pi} = r^2$ $\boxed{\sqrt{\frac{A}{\pi}} = r}$

$A_{triangle} = \frac{1}{2}bh$
Solve for height
$\frac{2A}{b} = \frac{bh}{b}$ $\boxed{h = \frac{2A}{b}}$

$F = \frac{9}{5}C + 32$
Solve for Celsius
$F - 32 = \frac{9}{5}C$
$\boxed{\frac{5}{9}(F-32) = C}$

$A_{trapezoid} = \frac{1}{2}h(b_1 + b_2)$
Solve for b_1
$2A = h(b_1 + b_2)$
$\frac{2A}{h} = b_1 + b_2$ $\boxed{b_1 = \frac{2A}{h} - b_2}$

<u>To Solve for a Variable:</u>

This means to rewrite the equation with a specific variable on one side of the equation.

Examples:

1. $3y + 4x = 24$ Solve for x.

$4x = 24 - 3y$

$x = \frac{24 - 3y}{4}$

or $x = 6 - \frac{3}{4}y$

2. $3y + 4x = 24$ Solve for y.

$3y = 24 - 4x$

$y = \frac{24 - 4x}{3}$

or $y = 8 - \frac{4}{3}x$

Use Slope-Intercept Form: $y = mx + b$

3. $6x + 5y = 30$ Solve for y.

$5y = -6x + 30$

$y = -\frac{6x + 30}{5}$ $y = -\frac{6}{5}x + 6$

Find y if $x = -10$. $y = \frac{-6}{5}(-10) + 6$

$y = 12 + 6$

$\boxed{y = 18}$

4. $9x - 6y = 63$ Solve for y.

$-6y = -9x + 63$

$y = \frac{-9x + 63}{-6}$ $y = \frac{3}{2}x - \frac{21}{2}$

Find y if $x = -10$. $y = \frac{3}{2}(-10) - \frac{21}{2}$

$y = -\frac{30}{2} - \frac{21}{2}$

$\boxed{y = -\frac{51}{2}}$

If the variable shows up in more than 1 term, you must apply the distributive property (factor).

5. $4y - xy = 9$ Solve for y.

$\frac{y(\cancel{4-x})}{\cancel{4-x}} = \frac{9}{4-x}$ factor out y

divide by expression

$y = \frac{9}{4-x}$

6. $xy - x = 40$ Solve for x.

$x(y-1) = 40$

$x = \frac{40}{y-1}$

Honors Algebra 2 Notes
1.3 Solve Linear Equations

Name Key

Equation: a statement saying that two expressions are equal.

To Solve an Equation:

1. Apply Distributive Property or Fraction Bust
2. Clean up- combine like terms on either side of the equal sign
3. Isolate the variable & keep the equation balanced
   - ✓ What you do to one side of the equation, you must do to the other side!
   - ✓ Undo the Order of Operations
4. Check your answer! *Substitute into the Original Equation.*

Examples:

1. $2c + 14 = 6 - 4c$

$+4c \qquad +4c$

$6c + 14 = 6$

$-14 \qquad -14$

$6c = -8$

$c = \frac{-8}{6} = -\frac{4}{3}$

$-\frac{8}{3} + 14 = 6 + \frac{16}{3}$

$-\frac{8}{3} + \frac{42}{3} = \frac{18}{3} + \frac{16}{3}$

$\frac{34}{3} = \frac{34}{3}$ ✓

2. $12(r + 3) = 2(r + 5) - 3r$

$12r + 36 = 2r + 10 - 3r$

$12r + 36 = -r + 10$

$13r + 36 = 10$

$13r = -26$

$r = -2$

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

$12(1) = 2(3)+6$

$12 = 6+6$ ✓

3. $\frac{6}{1}\left(\frac{1}{2}y + \frac{1}{3}y\right) = (10)\cdot 6$

either add with common denominator or Fraction Bust using that C.D.

$3y + 2y = 60$

$5y = 60$

$y = 12$

$\frac{1}{2}(12) + \frac{1}{3}(12) = 10$

$6 + 4 = 10$ ✓

4. $\frac{30}{1}\left(\frac{2}{5}k + \frac{1}{6}\right) = \left(\frac{3}{10}k + \frac{1}{3}\right)\cdot\frac{30}{1}$

$12k + 5 = 9k + 10$

$3k + 5 = 10$

$3k = 5$

$k = \frac{5}{3}$

$\frac{2}{5}\left(\frac{5}{3}\right) + \frac{1}{6} = \frac{3}{10}\left(\frac{5}{3}\right) + \frac{1}{3}$

$\frac{2}{3} + \frac{1}{6} = \frac{1}{2} + \frac{1}{3}$

$\frac{4}{6} + \frac{1}{6} = \frac{3}{6} + \frac{2}{6}$ ✓

***Special Cases:** No value fits for x OR Every # can fit for x

5. $5(x - 4) = 5x + 12$

$5x - 20 = 5x + 12$

$-20 \neq 12$

No Solution, $\varnothing$

6. $5(2 - x) = 3 - 2x + 7 - 3x$

$10 - 5x = 10 - 5x$

$10 = 10$

All Real #, $\mathbb{R}$

7. $2(x + 4) = -3x + 8$

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

$5x + 8 = 8$

$5x = 0$

$x = 0$

$2(0+4) = -3(0)+8$

$2 \cdot 4 = 0 + 8$

$8 = 8$ ✓