

Final Review #2  
Equations

Directions: Solve each of the following equations.

1)  $2(-3a + 5) + 6 = -4a - 10$

$$-6a + 10 + 6 = -4a - 10$$

$$\begin{array}{r} -6a + 16 = -4a - 10 \\ +4a \qquad +4a \end{array}$$

$$\begin{array}{r} -2a + 16 = -10 \\ -16 \qquad -16 \end{array}$$

$$\begin{array}{r} -2a = -26 \\ -2 \qquad -2 \end{array}$$

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

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

$$\begin{array}{r} 8x - 14 = 4 + 2x \\ -2x \qquad -2x \end{array}$$

$$\begin{array}{r} 6x - 14 = 4 \\ +14 \qquad +14 \end{array}$$

$$\begin{array}{r} 6x = 18 \quad x = 3 \\ 6 \qquad 6 \end{array}$$

2)  $-2(1 - 7y) = 8(y - 7)$

$$\begin{array}{r} -2 + 14y = 8y - 56 \\ -8y \quad -8y \end{array}$$

$$\begin{array}{r} -2 + 6y = -56 \\ +2 \qquad +2 \end{array}$$

$$\begin{array}{r} 6y = -54 \\ 6 \qquad 6 \end{array}$$

$$y = -9$$

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

$$10x + 30 = 20 + 8x + 3x$$

$$10x + 30 = 20 + 11x$$

$$\begin{array}{r} -10x \qquad -10x \end{array}$$

$$\begin{array}{r} 30 = 20 + x \\ -20 \quad -20 \end{array}$$

$$10 = x$$

Directions: Solve and graph each of the following inequalities. Express the solution in interval notation.

5)  $2 \leq 5x - (x + 4)$

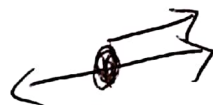
$$2 \leq 5x - x - 4$$

$$\begin{array}{r} 2 \leq 4x - 4 \\ +4 \qquad +4 \end{array}$$

$$\begin{array}{r} 6 \leq 4x \\ 4 \qquad 4 \end{array}$$

$$\frac{3}{2} \leq x$$

$$x \geq \frac{3}{2}$$



$$\frac{3}{2}$$

$$\left[ \frac{3}{2}, \infty \right)$$

6)  $-5(x - 2) \geq x + 28$

$$\begin{array}{r} -5x + 10 \geq x + 28 \\ +5x \qquad +5x \end{array}$$

$$\begin{array}{r} 10 \geq 6x + 28 \\ -28 \qquad -28 \end{array}$$

$$\begin{array}{r} -18 \geq 6x \\ 6 \qquad 6 \end{array}$$

$$-3 \geq x$$

$$x \leq -3$$



$$(-\infty, -3]$$

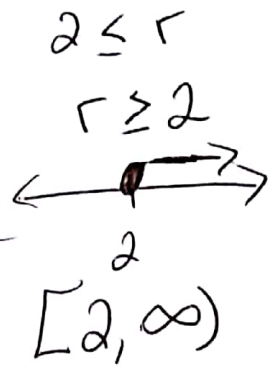
$$7) 2(1 - 4r) \leq -2(r + 3) - 4$$

$$2 - 8r \leq -2r - 6 - 4$$

$$2 - 8r \leq -2r - 10$$

$$\begin{array}{r} 2 - 8r \leq -2r - 10 \\ +18r \quad +18r \\ \hline 2 \leq 6r - 10 \\ +10 \quad +10 \\ \hline 12 \leq 6r \end{array}$$

$$\frac{12}{6} \leq \frac{6r}{6}$$



$$8) 20 - 2p > -2(p + 2) + 4p$$

$$20 - 2p > -2p - 4 + 4p$$

$$20 - 2p > 2p - 4$$

$$\begin{array}{r} 20 - 2p > 2p - 4 \\ +4p \quad +4p \\ \hline 20 > 4p - 4 \\ +4 \quad +4 \\ \hline 24 > 4p \\ \frac{24}{4} > \frac{4p}{4} \\ 6 > p \rightarrow p < 6 \end{array}$$

$(-\infty, 6)$

Directions: Solve each of the following equations.

$$9) |m + 3| = 2$$

drop  $\swarrow$   $\searrow$   $-( )$   
 $m + 3 = 2$        $-(m + 3) = 2$   
 $-3 \quad -3$        $-m - 3 = 2$   
 $\hline$        $-m = 5$   
 $m = -1$        $m = -5$

$$10) 3|3x + 2| = 15$$

$$|3x + 2| = 5$$

$$\begin{array}{r} 3x + 2 = 5 \\ -2 \quad -2 \\ \hline 3x = 3 \\ \frac{3x}{3} = \frac{3}{3} \\ x = 1 \end{array}$$

$$\begin{array}{r} -(3x + 2) = 5 \\ -3x - 2 = 5 \\ +2 \quad +2 \\ \hline -3x = 7 \\ \frac{-3x}{-3} = \frac{7}{-3} \\ x = \frac{7}{-3} \end{array}$$

$$11) |6m - 2| = 0$$

$$\begin{array}{r} 6m - 2 = 0 \\ +2 \quad +2 \\ \hline 6m = 2 \\ \frac{6m}{6} = \frac{2}{6} \\ m = \frac{1}{3} \end{array}$$

$$\begin{array}{r} -(6m - 2) = 0 \\ -6m + 2 = 0 \\ -2 \quad -2 \\ \hline -6m = -2 \\ \frac{-6m}{-6} = \frac{-2}{-6} \\ m = \frac{1}{3} \end{array}$$

$$12) |7x - 2| = 44$$

$$\begin{array}{r} 7x - 2 = 44 \\ +2 \quad +2 \\ \hline 7x = 46 \\ \frac{7x}{7} = \frac{46}{7} \\ x = \frac{46}{7} \end{array}$$

$$\begin{array}{r} -(7x - 2) = 44 \\ -7x + 2 = 44 \\ -2 \quad -2 \\ \hline -7x = 42 \\ \frac{-7x}{-7} = \frac{42}{-7} \\ x = -6 \end{array}$$

$$13) \sqrt{2x - 1} + 5 = 2$$

$$\begin{array}{r} \sqrt{2x - 1} + 5 = 2 \\ -5 \quad -5 \\ \hline \sqrt{2x - 1} = -3 \\ \sqrt{\quad}^2 = (-3)^2 \\ 2x - 1 = 9 \\ +1 \quad +1 \\ \hline 2x = 10 \\ \frac{2x}{2} = \frac{10}{2} \\ x = 5 \end{array}$$

$$14) \sqrt{3x - 8} = 4$$

$$\begin{array}{r} 3x - 8 = 16 \\ +8 \quad +8 \\ \hline 3x = 24 \\ \frac{3x}{3} = \frac{24}{3} \\ x = 8 \end{array}$$

$$11) \sqrt{1+y} = 3^2$$

$$1+y = 9$$

$$-1 \quad -1$$

$$y = 8$$

$$12) 8 + \sqrt{2x-1} = 15$$

$$-8$$

$$-8$$

$$\sqrt{2x-1} = 7^2$$

$$2x-1 = 49$$

$$+1 \quad +1$$

$$\frac{2x}{2} = \frac{50}{2}$$

$$x = 25$$

Mixed Review: Directions: Solve each of the following.

13) Solve:  $10(1 + 3b) = -20$

$$10 \cancel{+} 30b = -20$$

$$-10$$

$$\frac{30b}{30} = \frac{-30}{30}$$

$$b = -10$$

14) Solve:  $-3(4x + 3) + 4(6x + 1) = 43$

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

$$12x - 5 = 43$$

$$+5 \quad +5$$

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

$$x = 4$$

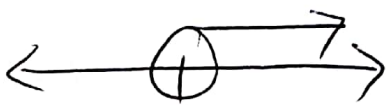
15) Solve, graph and state the interval notation of  $3(6b - 1) > 18 - 3b$

$$\begin{array}{r} 18b - 3 > 18 - 3b \\ +3b \qquad \qquad +3b \end{array}$$

$$\begin{array}{r} 21b - 3 > 18 \\ +3 \quad +3 \end{array}$$

$$\frac{21b}{21} > \frac{21}{21}$$

$$b > 1$$



$(1, \infty)$

16) Solve, graph and state the interval notation of  $-6(1 + 6x) \leq 6(1 - 5x)$

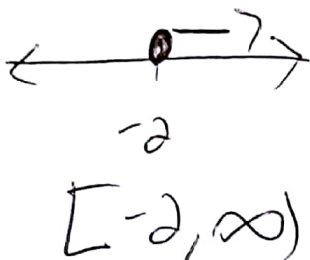
$$\begin{array}{r} -6 - 36x \leq 6 - 30x \\ +36x \quad +36x \end{array}$$

$$\begin{array}{r} -6 \leq 6 + 6x \\ -6 \quad -6 \end{array}$$

$$\begin{array}{r} -12 \leq 6x \\ 6 \quad 6 \end{array}$$

$$-2 \leq x$$

$$x \geq -2$$



17) Solve:  $|3x + 2| - 5 = 4x$

$$+5 +5$$

$$|3x + 2| = 4x + 5$$

$$\begin{array}{r} 3x + 2 = 4x + 5 \\ -3x \quad -3x \end{array}$$

$$\begin{array}{r} 2 = x + 5 \\ +5 \quad +5 \end{array}$$

$$7 = x$$

19) Solve:  $\sqrt{2x - 3} = 5$

$$\begin{array}{r} 2x - 3 = 25 \\ +3 \quad +3 \end{array}$$

$$\begin{array}{r} 2x = 28 \\ 2 \quad 2 \end{array}$$

$$x = 14$$

18) Solve:  $|3p - 2| = 28$

$$\begin{array}{r} 3p - 2 = 28 \\ +2 \quad +2 \end{array}$$

$$\begin{array}{r} 3p = 30 \\ 3 \quad 3 \end{array}$$

$$p = 10$$

$$-(3p - 2) = 28$$

$$\begin{array}{r} -3p + 2 = 28 \\ -2 \quad -2 \end{array}$$

$$\begin{array}{r} -3p = 26 \\ -3 \quad -3 \end{array}$$

$$p = \frac{26}{-3}$$

20) Solve:  $4 + \sqrt{1 - 3x} = 12$

$$\begin{array}{r} -4 \quad -4 \\ \sqrt{1 - 3x} = 8 \end{array}$$

$$1 - 3x = 64$$

$$\begin{array}{r} -1 \quad -1 \end{array}$$

$$\begin{array}{r} -3x = 63 \\ -3 \quad -3 \end{array}$$

$$x = \frac{63}{-3}$$