

48 poss + 4 Bonus = 52

MAT 099

2.4 - 2.7, 3.1, 3.2

Due Wed, Feb 8th

Name KEY

1. **Recall:** The compound interest formula is $A = P\left(1 + \frac{r}{n}\right)^{nt}$

If a principal amount of \$6,000 is invested in an account paying an annual percentage rate of 4%, find the amount in the account after 4 years, if the account is compounded monthly.

$$6000\left(1 + \frac{0.04}{12}\right)^{12 \cdot 4} \approx \$7039.19$$

Solve the following absolute value equations and inequalities. Write solution sets in set-builder notation and, for the inequalities, use interval notation, as well.

2. $|5x - 2| \geq 4$

$$5x - 2 \geq 4 \quad \text{OR} \quad 5x - 2 \leq -4$$

$$5x \geq 6 \quad \text{OR} \quad 5x \leq -2$$

$$\left\{x \mid x \geq \frac{6}{5} \quad \text{OR} \quad x \leq -\frac{2}{5}\right\}$$

$$= \left(-\infty, -\frac{2}{5}\right] \cup \left[\frac{6}{5}, \infty\right)$$

4. $|-9x + 7| = 3$

$$-9x + 7 = 3 \quad \text{OR} \quad -9x + 7 = -3$$

$$-9x = -4 \quad \text{OR} \quad -9x = -10$$

$$x = \frac{4}{9} \quad \text{OR} \quad x = \frac{10}{9}$$

$$x \in \left\{\frac{4}{9}, \frac{10}{9}\right\}$$

3. $|5x - 2| < 4$

$$5x - 2 < 4 \quad \text{AND} \quad 5x - 2 > -4$$

$$5x < 6 \quad \text{AND} \quad 5x > -2$$

$$\left\{x \mid x < \frac{6}{5} \quad \text{AND} \quad x > -\frac{2}{5}\right\}$$

$$= \left(-\frac{2}{5}, \frac{6}{5}\right)$$

5. $|-9x + 7| \leq 3$

$$-9x + 7 \leq 3 \quad \text{AND} \quad -9x + 7 \geq -3$$

$$-9x \leq -4 \quad \text{AND} \quad -9x \geq -10$$

$$x \geq \frac{-4}{-9} \quad \text{AND} \quad x \leq \frac{-10}{-9}$$

$$\left\{x \mid x \geq \frac{4}{9} \quad \text{AND} \quad x \leq \frac{10}{9}\right\}$$

$$= \left[\frac{4}{9}, \frac{10}{9}\right]$$

6. $|9x + 7| = -3$

\emptyset

7. $|9x + 7| < -3$

\emptyset

8. $|9x + 7| > -3$

$(-\infty, \infty)$

9. Bonus $|9x+7|=|3x-1|$

$9x+7=3x-1$ OR $9x+7=-(3x-1)=-3x+1$

$6x=-8$

$x=-\frac{8}{6}=-\frac{4}{3}$ OR

$12x=-6$

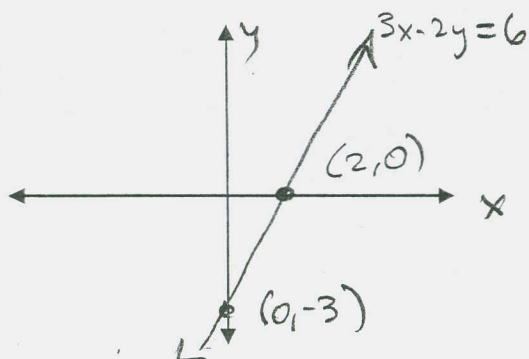
$x=-\frac{1}{2}$

$\left\{ -\frac{4}{3}, -\frac{1}{2} \right\}$

10. Sketch the graph of each of the following equations. Include the intercepts, and if the intercepts are all you label on your graph, that's just fine with me!

a. $3x-2y=6$ (In what form is this linear equation?)

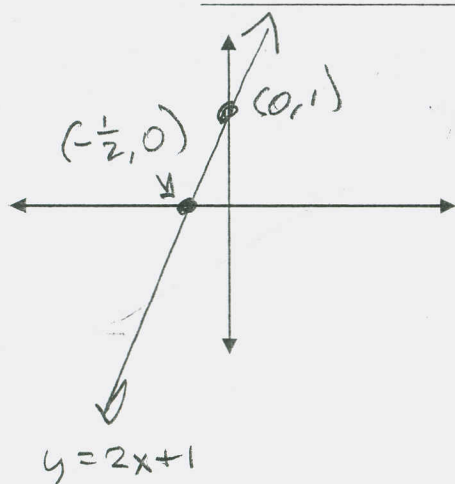
STANDARD



x	y
0	-3
2	0

b. $y=2x+1$ (In what form is this linear equation?)

SLOPE-INTERCEPT



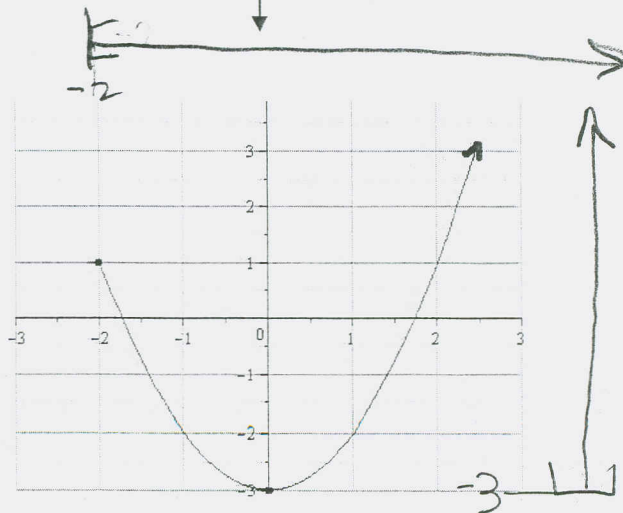
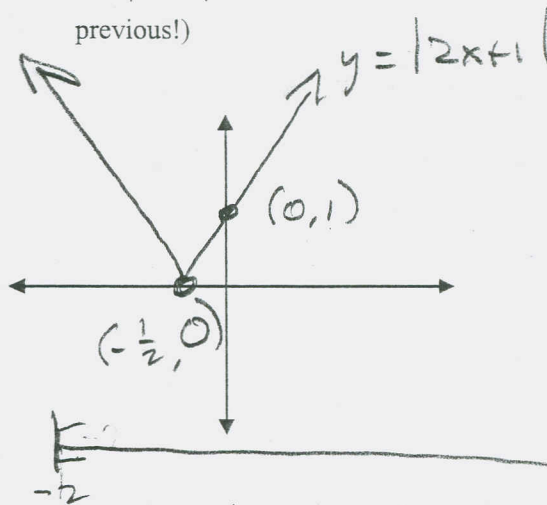
x	y
0	1
-1/2	0

$0=2x+1$

$-2x=1$

$x=-\frac{1}{2}$

c. $y=|2x+1|$ (Reflect on the previous!)



11. Determine the domain and range of the relation from its graph. Use Interval notation in your answer.

$D = [-2, \infty)$

$R = [-3, \infty)$