INTERMEDIATE ALGEBRA **TEST 1** 92/100 (Excellent!) NAME: Kelly Fenton

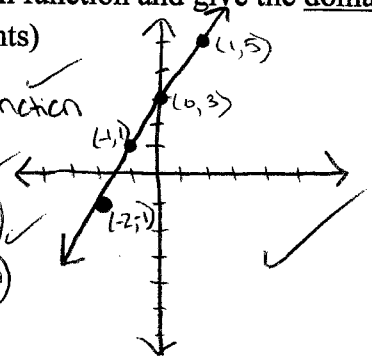
No books and no notes. **Be sure to set up each problem before evaluation. Show all work** in the space provided for full credit.

1. Use "vertical line test" to check whether each relation defines y as a function of x. Is that a function? Is that a linear function? Graph each function and give the domain and range.

a) $y = 2x + 3$ (6 points)

x	y
0	3
1	5
-1	1
-2	-1

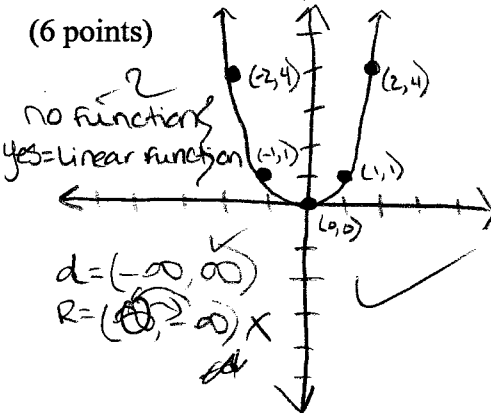
yes=linear function
yes=function
D: $(-\infty, \infty)$
R: $(-\infty, \infty)$
-1



b) $y = x^2$ (6 points)

x	y
0	0
1	1
2	4
-1	1
-2	4

2
no function
yes=linear function
D: $(-\infty, \infty)$
R: $(0, \infty)$ X



2. Let $f(x) = 3x + 1$. Find the following. (9 points)

a) $f(-4) =$ $3(-4)+1$ $-12+1=(-11)$

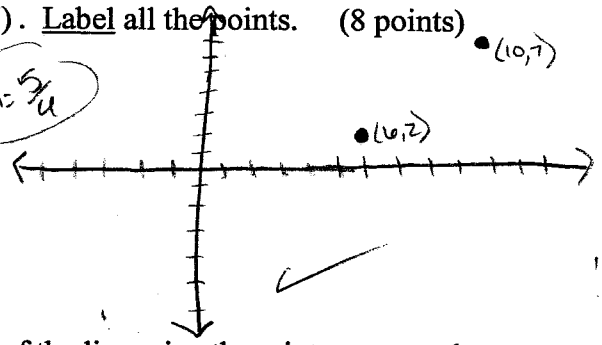
b) $f(x+5) =$ $3(x+5)+1=$ $3x+15+1=$ $3x+16$

-6

3. Graph and find the slope of a line through the points (6,2) and (10,7). Label all the points. (8 points)

$\frac{y_1-y_2}{x_1-x_2}$ $\frac{7-2}{10-6}=\frac{5}{4}$

m: 5/4



4. Write the following equation in slope-intercept form, give the slope of the line, give the y-intercept, and graph the line. Label the line and all the points. (8 points)

$y=mx+b$

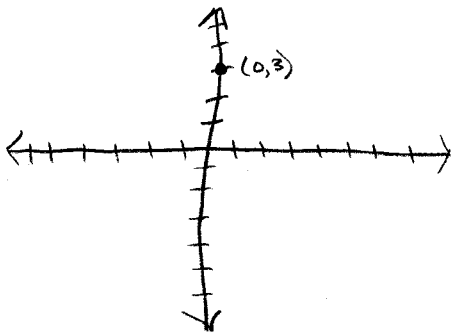
$3y + x = 9$

$\frac{3y}{3}=\frac{mx+9}{3}$ -1

$y=\frac{1}{3}x+3$

$m=\frac{1}{3}$ ✓

y int=3 ✓



5. Using the point-slope form to find an equation of the line that satisfies the given conditions. Write the equation in slope-intercept form. (10 points)

Through $(-2,7)$; slope $-\frac{3}{2}$

$y-7=\frac{-3}{2}(x-(-2))$

$y-7=\frac{-3}{2}x-3$

$+7 \quad +7$

$y=\frac{-3}{2}x+4$

6. Solve the following linear equation: (8 points)

$4 \cdot \frac{2x-1}{2 \cdot 4} - \frac{2x-6}{4} = x+3 \cdot 4$

$2x-2-2x+6=4x+12$

$4=4x+12$

$-12 \quad -12$

$\frac{-8}{4}=\frac{4x}{4}$

$x=-2$

7. Francis took 180 minutes to drive to his annual family reunion, 210 miles away. What was his speed (rate) in miles per hour? (6 points)

$d=rt$

$210=r \cdot 3$

$\frac{210}{3}=\frac{3r}{3}$

$r=70$ mph

$180 \cdot \frac{1}{60}$ $\quad 3\overline{)210}$ $\quad 70$

8. The width of a rectangle lot is 100 feet more than the length. Find the width and the length of the rectangle lot if the perimeter of the lot is 1200 feet. (10 points)

$P=2L+2w$

$P=2L+2(100)$

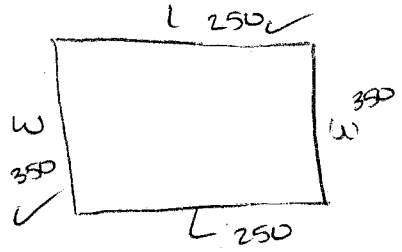
$1200=2L+200$

$-200 \quad -200$

$\frac{1000}{2}=\frac{2L}{2}$

$L=500$

$w=700$



-4

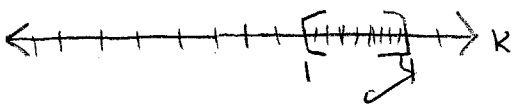
9. Solve the following linear inequality, graph and give the solution sets (including the interval notation): (6 points)

$-3 \leq -3k+9 \leq 6$

$-9 \quad -9$

$\frac{-12}{-3} \leq \frac{-3k}{-3} \leq \frac{-3}{-3}$

$4 \geq k \geq 1$



Sol. Set $\{k \mid 1 \leq k \leq 4\}$

int. notation $[1, 4]$

10. For the following compound inequalities, state whether intersection or union should be used. Then graph and give the solution sets (including the interval notation): (7 points)

$-3x+1 \le 7$ and $2+x \le 5$

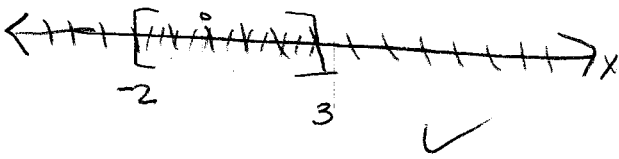
$-3x \le 6$ $\quad$ $x \le 3$

intersection

$x \ge -2 \cap x \le 3$

Sol. Set $\{x \mid x \ge -2 \text{ and } x \le 3\}$

Intv. Not. $[-2, 3]$



11. Complete the sets of numbers for the following: (6 points)

a) Natural Numbers $= \{1, 2, 3, 4, \ldots\}$

b) Whole Numbers $= \{0, 1, 2, 3, \ldots\}$

c) Integers $= \{\ldots, -2, -1, 0, 1, 2, 3, \ldots\}$

12. Evaluate the following: (12 points)

a) $|10|+|-8|+3 =$

$10+8+3 = 21$

b) $|7-9+1| =$

$-2+1$

$|-1| = 1$

c) $|6.5-8+1| =$

$-1.5+1$

$.5$

8.10

-6.5

-1.5

$+1$

d) $4^5 \cdot 4^2 = 4^7$

e) $\frac{x^8}{x^3} = x^{8-3} = x^5$

f) $(x^{-2})^3 = x^{-6} = \frac{1}{x^6}$

-0