

Name: Key

Date: _____

Characteristics of Functions

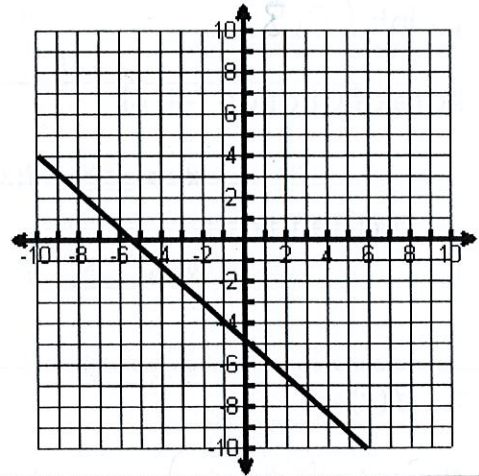
1.

- a. Domain: $(-\infty, \infty)$ b. Range: $(-\infty, \infty)$
 c. Increasing: \emptyset d. Decreasing: $(-\infty, \infty)$
 e. y-int: $(0, -5)$ f. x-int: $(-5.5, 0)$

$x \rightarrow \infty \quad f(x) \rightarrow -\infty$

g. End Behavior:

$x \rightarrow -\infty \quad f(x) \rightarrow \infty$



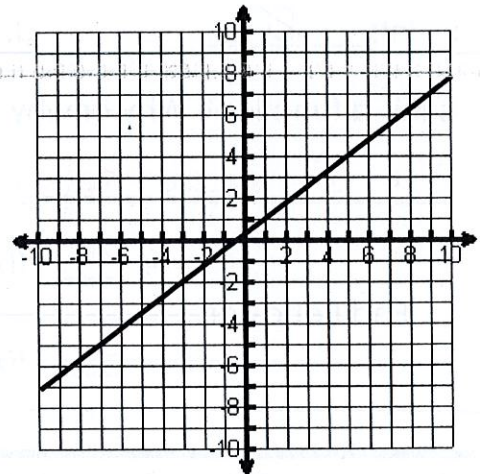
2.

- a. Range: $(-\infty, \infty)$ b. Roots: $(-0.5, 0)$
 c. Increasing: $(-\infty, \infty)$ d. y-int: $(0, 0.5)$
 e. Rate of Change $[-2, 1]$: $\frac{1-1}{1-2} = \frac{2}{3}$

$x \rightarrow \infty \quad f(x) \rightarrow \infty$

f. End Behavior:

$x \rightarrow -\infty \quad f(x) \rightarrow -\infty$



3. $f(x) = 3x - 12$

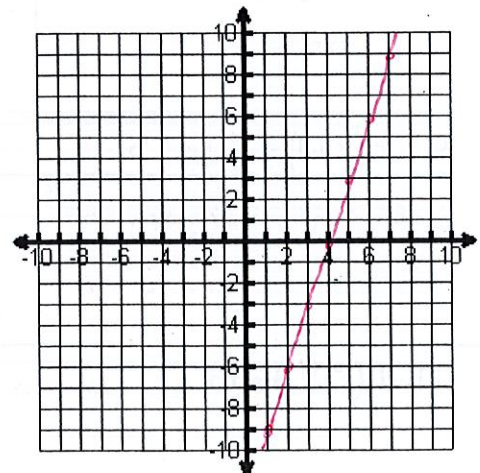
- a. Domain: $(-\infty, \infty)$ b. y-int: $(0, -12)$
 c. Solutions: $(4, 0)$ d. Decreasing: \emptyset
 e. Is this a function? Why or why not?

Yes. It passes the vertical line test.

$x \rightarrow \infty \quad f(x) \rightarrow \infty$

f. End Behavior:

$x \rightarrow -\infty \quad f(x) \rightarrow -\infty$



4. $8x + 2y = 6$ $y = -4x + 3$

a. Increasing: $(-\infty, \infty)$ b. Decreasing: $(-\infty, \infty)$

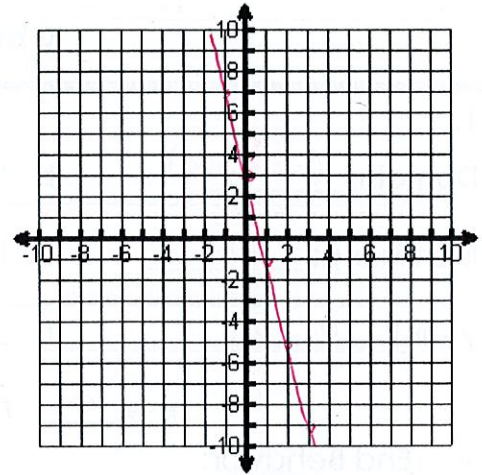
c. y-int: $(0, 3)$ d. zeros: $(0.75, 0)$

e. Rate of Change $[-4, 6]$: $\frac{-27-19}{6+4} = \frac{-46}{10} = -4.6$ (Look familiar?)

$x \rightarrow \infty$ $f(x) \rightarrow -\infty$

f. End Behavior:

$x \rightarrow -\infty$ $f(x) \rightarrow \infty$



5. $f(x) = 6$

a. Domain: $(-\infty, \infty)$ b. Increasing: \emptyset

c. x-int: \emptyset d. Range: $[6]$

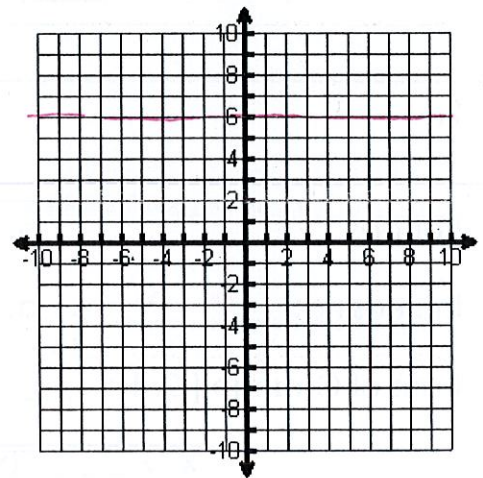
e. Is this a function? Why or why not?

Yes, it passes the vertical line test

$x \rightarrow \infty$ $f(x) \rightarrow 6$

f. End Behavior:

$x \rightarrow -\infty$ $f(x) \rightarrow 6$



Review: Given $f(x) = -x^2 + 4x - 1$ $g(x) = 2x^2 - 5x$ $h(x) = -2x + 7$

6. $f(-2) = -13$

$-(-2)^2 + 4(-2) - 1$
 $-4 + -8 - 1$

7. $f(g(1)) = -22$

$g(1) = 2(1)^2 - 5(1) = 2 - 5 = -3$
 $f(-3) = -(-3)^2 + 4(-3) - 1 =$

8. $h(2) + f(3) = 5$

$h(2) = -2(2) + 7 = 3$
 $f(3) = -(3)^2 + 4(3) - 1 = 2$

9. $h(x+1) = -2x + 5$

$-2(x+1) + 7$
 $-2x - 2 + 7$

10. $3g(2) + 1 = -5$

$g(2) = 2(2)^2 - 5(2) = 8 - 10 = -2$
 $3(-2) + 1 = -6 + 1$

11. $h(-4) = 15$

$-2x + 7 = 15$
 $-2x = 8$
 $x = -4$

(not on Hw Guide)