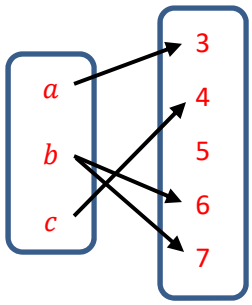
PS6: Functions & Their Graphs (Chapter 1) Review A Name _____ Date _____ Period ___

Show your work for full credit.

1) Determine if the relation is a function. Then decided if it is One-To-One.

a. $\{(2,3),(3,4),(5,1),(6,2),(2,4)\}$ **b**. $\{(-2,3),(7,3),(1.5,1),(1.1,3),(-52,1)\}$ c.



2) Determine if the equation represents a function of x. Show your work.

a. $5x + 3y^2 = 17$

b. $\sqrt{x+1} + y = 0$

c. $|y| = 4x + 1$ (hint: plug in points for x)

3) Evaluation the function as indicated. $f(x) = 2x^2 - 6x$

a. $f(-3)$

b. $f(r^3)$

c. $\frac{f(x+h)-f(x)}{h}$

4) Evaluation the function as indicated. $h(x) = \sqrt{x+3}$.

a. $h(22)$ b. $h(t^2 - 3)$ c. $\frac{h(6)}{h(x)}$

5) Find the domain of the functions. Graph the function using a GDC to verify your answer. (don't need to graph by hand) (Use interval notation)

a. $f(x) = x^2 + 3x - 5$

b. $f(x) = \frac{4x^2}{x^2-5x+6}$

c. $f(x) = \sqrt{2x-4}$

d. $f(x) = \frac{3}{\sqrt{x-5}}$

6) Find the domain and range of the functions. Use a graph to help you find the range.

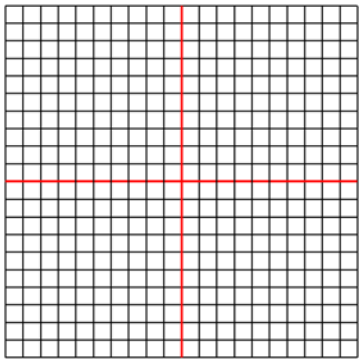
a. $f(x) = 1 - 3x^2$

b. $f(x) = \sqrt{x^2 + 3}$

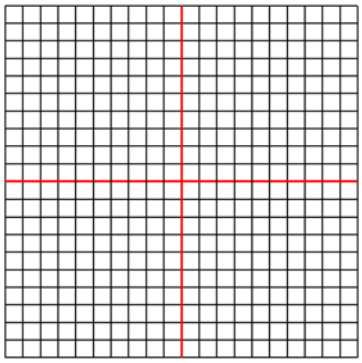
c. $f(x) = |2x + 3| - 9$

7) Graph the equation using a GDC and use the vertical line test to decide if it is a function. State the domain if it is a function. Make a quick sketch of the graph (no need to plot points).

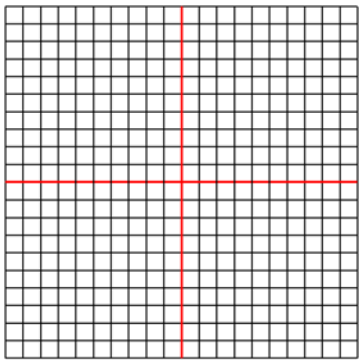
a. $y = \frac{x+3}{x}$



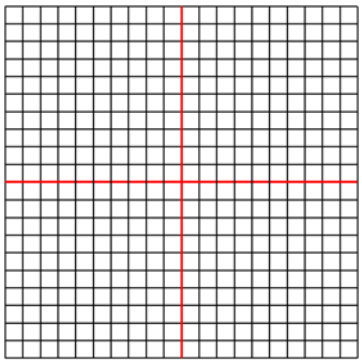
c. $3x + y^3 = 8$



b. $y = 3 - |x + 5|$



e. $x^2 + y^2 = 25$



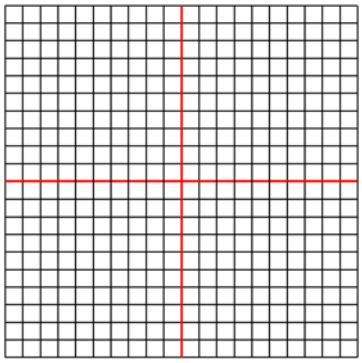
8) Determine the function is odd, even or neither algebraically.

a. $h(x) = \frac{1}{x^2+1}$

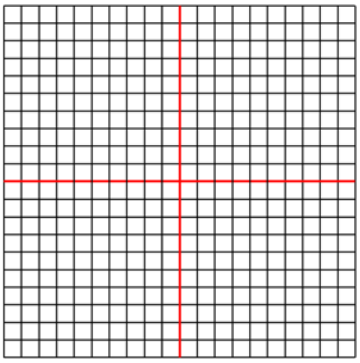
b. $f(x) = x^3 - x$

9) Determine a) if there are any local maximum or minimum values, b) the intervals the function is increasing, decreasing or constant, and c) if it's odd, even or neither. Make an accurate sketch of the graph. label.

a. $f(x) = 4x^2 + 4x + 1$

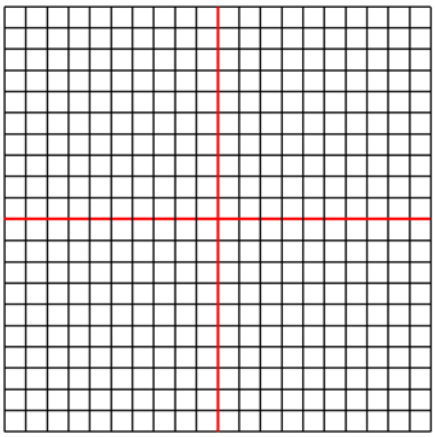


c. $f(x) = -3|x| + 3$

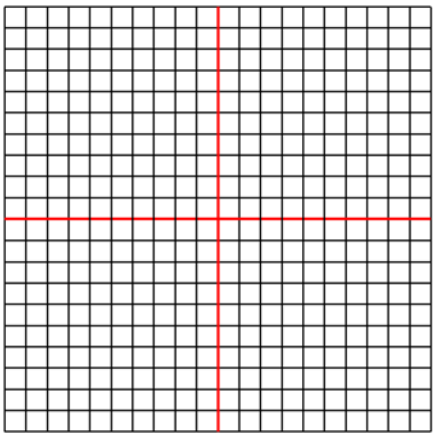


10) Sketch the graph by hand and name the transformations and the base graph. Be accurate.

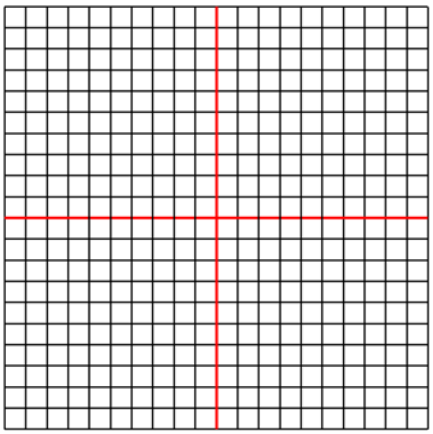
a. $f(x) = (x-2)^2 + 1$



b. $f(x) = \sqrt{x+5} - 1$



c. $f(x) = -\frac{1}{2}(x-4)^3 + 1$



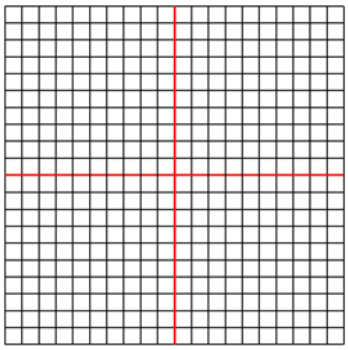
11) Let $f(x) = 2x^2 + 2$, $g(x) = \sqrt{x-2}$ and $h(x) = 2x^2 - 2$. Find and state the domain of:

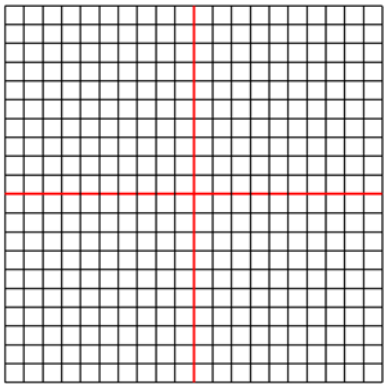
a. $(f-h)(x)$ b. $(fg)(x)$ c. $\left(\frac{h}{g}\right)(x)$

d. $(f \circ g)(x)$ e. $g(h(x))$ f. find $g(f(3))$. (No domain needed)

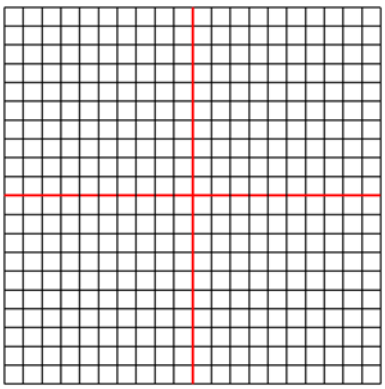
12) Find the inverse of f **algebraically** if it exists. If it doesn't exist, Show the graph fails the horizontal line test. If it does, quick Sketch f *and* f^{-1} as well as the **identity function** (quick sketches should use a GDC).

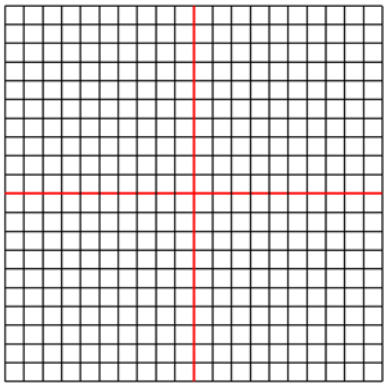
a. $f(x) = \frac{x-6}{x+2}$ b. $f(x) = \sqrt{2x-2}$ (note: $y \geq 0$)





c. $f(x) = -2x^2 + 3$ d. $f(x) = \sqrt[3]{x-4}$

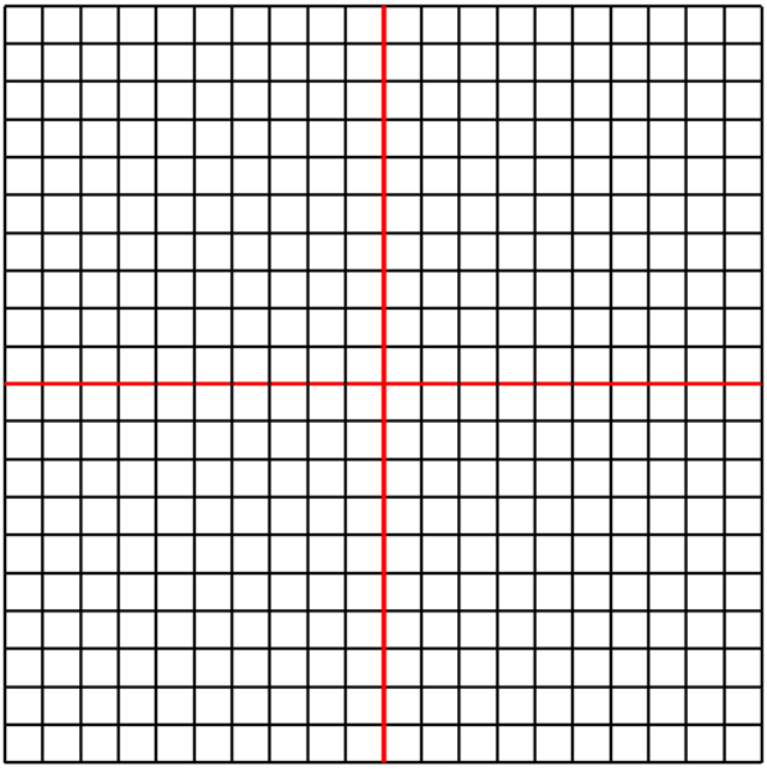




13)

a) Graph the piece-wise function.

$$f(x) = \begin{cases} \frac{1}{2}x^2 - 4, & x < -1 \\ 5, & -1 \leq x \leq 4 \\ x - 10, & x > 4 \end{cases}$$



b) What does $f(-1) =$

c) What does $f(5) =$