Name: _____ **Algebra II**
Date: **Quiz 0.1**

Problem 1. The following sets of points are in the form (x, y) where the x values are considered as inputs and y values are outputs and thereby define a rule. Determine which of these define functions and for those that don't, explain why.

(a) $\{(1, 2), (2, 3), (3, 4), (4, 5)\}$

(b) $\{(4, 2), (3, 3), (3, 2), (1, 5)\}$

(c) $\{(2.01, 1.32), (2.02, 3.1), (2.03, 2.4), (2.001, 5.7)\}$

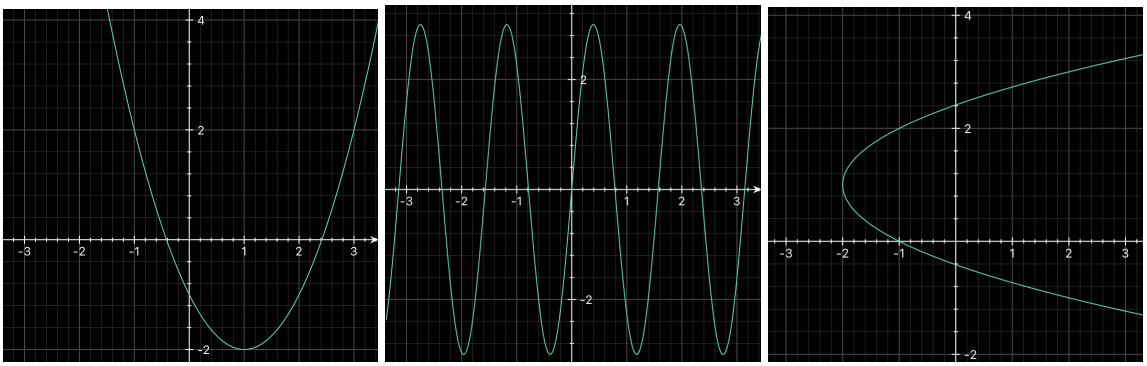
(d) $\{(2.01, 2.02), (2.02, 2.02), (2.03, 2.02), (2.001, 2.02)\}$

(e) $\{(\text{red}, \beta), (\text{green}, \gamma), (\text{blue}, \alpha), (\text{white}, \delta)\}$

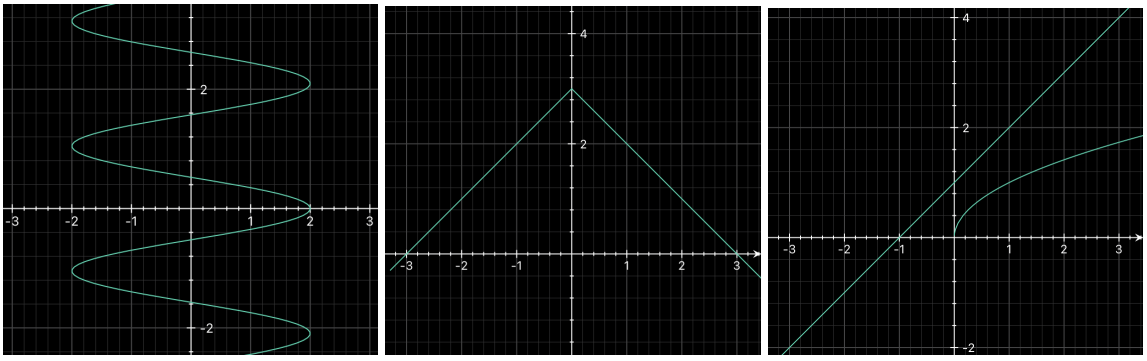
(f) $\left\{(2^3, 2), (3, 3), (2, 3), (8, 5)\right\}$

(g) $\left\{(2^3, 2), (3, 3), (2, 3), (8, 2)\right\}$

Problem 2. The following graphs define relationships between inputs (on the horizontal, or x, axis) and outputs (on the y axis). Determine which ones define functions and which do not. Briefly explain your choices.



(a) (b) (c)



(d) (e) (f)

Problem 3. Graph the following lines and write its slope. Be sure to label your axes, and if applicable, the x and y intercepts.

(a) $y = -2x$

(b) $y = 5$

(c) $y = 2x + 3$

(d) $x + y = 1$

(e) $x = -3$

(f) $2x - 3y = 5$

(g) Do these lines define functions? How do you know? For each line, what's the domain? What's the range?

Problem 4. Graph the following functions. Be sure to label your axes, and if applicable, the axes intercepts.

(a) $f(x) = x^2$

(b) $g(z) = -z^2$

(c) $h(a) = a^2 - 4$

(d) $y(x) = \frac{1}{2}x - 1$

(e) $z(t) = 1 - t^2$ (Hint: consider $g(t) = -t^2$ from above. Then $g(t) + 1 = -t^2 + 1 = 1 - t^2$ is just a shift of g up by 1.)

(f) $q(p) = -\frac{3}{2}p + 1$

Problem 5. Let $f(x) = x + 1$, $g(x) = \sqrt{x}$, and $h(x) = \frac{1}{x}$. Compute the following.

(a) $f(-2)$

(b) $g(4)$

(c) $h(0)$

(d) $f(g(x))$

(e) $g(f(x))$

(f) $h(g(f(x)))$

(g) $f(h(g(x)))$

(h) For (d) - (g) state the domain of each function in interval notation. (Example: the domain of $h(f(x)) = \frac{1}{x+1}$ would be all real numbers such that the denominator, $x + 1$, is not 0. So we must have $x + 1 \neq 0$, therefore $x \neq -1$. Then all real numbers except for -1 are allowable inputs to $h(f(x))$. In interval notation, we have $(-\infty, -1) \cup (-1, \infty)$.)

(i) $f^{-1}(x)$

(j) $g^{-1}(x)$

(k) $h^{-1}(x)$