## Quiz 1

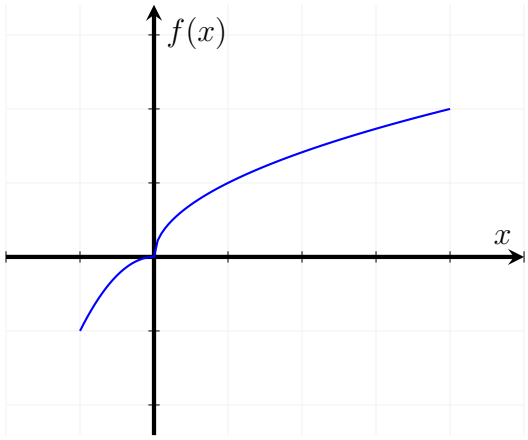
Note that $\mathbb{R} = (-\infty, \infty) =$ "all real numbers."

1. Write down your major.
2. Let $f : \mathbb{R} \to \mathbb{R}$ and $g : \mathbb{R} \to \mathbb{R}$ be defined by the following rules:

$$f(x) = \log_2(x) + 2\log_2(3) - \log_2(5) \qquad g(x) = \log_2\left(\frac{9x}{5}\right)$$

   Determine if the functions $f$ and $g$ are equal.

3. Let $f$ be given by the following graphical representation:




   Determine the following:
   (a) What type of function representation is this?
   (b) What is $f(1)$ and $f(-1)$?
   (c) What is the domain and range of $f$?
   (d) Is this function one-to-one?
   (e) Is this function even, odd, both or neither?
   (f) When does $f(x) = 3$?
   (g) Is the function increasing, decreasing or neither on the interval $(0, 3)$?

## Additional Exercises

1. Let $f : \mathbb{R} \to \mathbb{R}$ and $g : \mathbb{R} \to \mathbb{R}$ and determine if $f = g$ when,
   (a)
   $$f(x) = e^x e^{3-2x} + e^0 \qquad\qquad g(x) = e^{3-x}$$
   (b)
   $$f(x) = \cos(-x) - \tan(-x)\sin(x + 2\pi) \qquad\qquad g(x) = \sec(x)$$
2. Let $f : \mathbb{R} \to \mathbb{R}$ and $g : \mathbb{R} \to \mathbb{R}$, determine if $fg$ is even, odd, both, or neither.
   (a) If $f$ is even and $g$ is even.
   (b) If $f$ is even and $g$ is odd.
   (c) If $f$ is odd and $g$ is even.
   (d) If $f$ is odd and $g$ is odd.
3. Let $f : \mathbb{R} \to \mathbb{R}$ be a function, can $f$ be both even and odd?
4. Let $s$ be the side of a cube, determine the surface area and volume of the cube as a function of the side $s$.
5. Let $s$ be the shorter side of a rectangle. Suppose that one side of the rectangle is twice the length of the other side. Determine the formula for the area and perimeter of the rectangle as a function of the side $s$.
6. Let $f : \mathbb{R} \to \mathbb{R}$ be defined by $f(x) = \sin(x)$, compute the following:
   (a) $f(0)$
   (b) $f(\frac{\pi}{3})$
   (c) $f(\frac{\pi}{4})$
   (d) $2f(a)$
   (e) $f(3a)$
   (f) $f(-a)$
   (g) $f(a + h)$
   (h) $f(a^2)$
   (i) $f(a)^2$