1. Let $f(x) = x^2 + 2x$. Evaluate:

   (a) $f(2) = 8$

   (b) $f(-3) = 3$

   (c) $f(a) = a^2 + 2a$

   (d) $f(a+b) = (a+b)^2 + 2z + 2b = a^2 + b^2 + 2ab + 2a + 2b$

   (e) $f(2x) = 4x^2 + 4x$

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

   (g) $\dfrac{f(x+h) - f(x)}{h} = 2x + 2 + h$

2. Let $g(x) = \dfrac{1}{1-x}$. Evaluate:

   (a) $g(0) = 1$

   (b) $g(1)$ undefined

   (c) $g(x^2) = \frac{1}{1-x^2}$

   (d) $g\left(\frac{1}{x}\right) = \frac{x}{x-1}$

3. Determine if the following are functions:

   (a)

x	y
-1	9
0	10
1	11
2	12

   YES

   (b) $\{(0,3), (-2,1), (1,5), (0,-4), (2,-1)\}$ NO

   (c) $\{(5,7), (-1,6), (0,3), (1,6)\}$ YES

   (d) $f(x) = \begin{cases} x+1, & x \geq 1 \\ -x-3, & x \leq 1 \end{cases}$ NO

4. Find the domain and range of the following functions.

   (a) the horizontal line $y = 4$
   D: $(-\infty, \infty)$ R: $\{4\}$

   (b) $\{(0,6), (-1,1), (1,7), (3,-4), (2,0)\}$
   D: $\{-1, 0, 1, 2, 3\}$ R: $\{-4, 0, 1, 6, 7\}$

   (c) $g(x) = \begin{cases} 3, & -5 \leq x < 0 \\ -x, & x > 0 \end{cases}$
   D: $[-5, 0) \cup (0, \infty)$ R: $\{3\} \cup (-\infty, 0)$

   (d) The relation which assigns to each UH student the last digit of their student ID number.
   D: UH Students R: $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$

Know the graphs of each of the following basic functions.

(1) constant function: $f(x) = c$, where c is a real number

(2) linear function: $f(x) = ax + b$, where a, b are real numbers

(3) square function: $f(x) = x^2$

(4) cube function: $f(x) = x^3$

(5) inverse function: $f(x) = \dfrac{1}{x}$

(6) inverse square function: $f(x) = \dfrac{1}{x^2}$

(7) square root function: $f(x) = \sqrt{x}$

(8) cube root function: $f(x) = \sqrt[3]{x}$

(9) absolute value function: $f(x) = |x|$