MTH 95 Lesson 8 - The Formal Definition of a Function

Name: _____

A Function is a **relationship** between **inputs** and **outputs** such that for each input in the domain of the function there is exactly one output.
The **relationship** is simply the rule connecting the inputs to the outputs.

1. Determine whether the following sets of inputs and outputs constitute a function. What is the domain and range of each?

   a. $\{(A1, Pretzels), (A2, Fritos), (A3, Fritos), (A4, Cheetos),$
   $(B1, Butterfinger), (B2, ThreeMusketeers), (B3, Skittles), (B4, Snickers),$
   $(C1, SpearmintGum), (C2CinnamonGum), (C3, Mints), (C4, LifeSavers)\}$

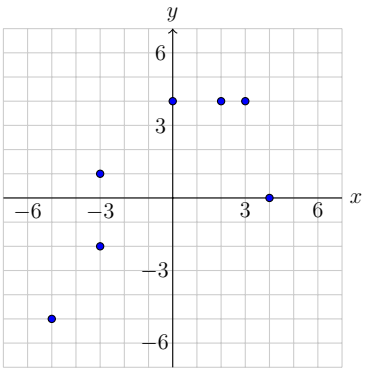
   b. $\{(1, 6), (2, 6), (3, 8), (4, 9)\}$

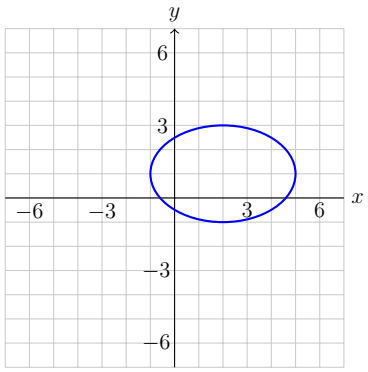
   c. $\{(6, 1), (6, 2), (8, 3), (9, 4)\}$

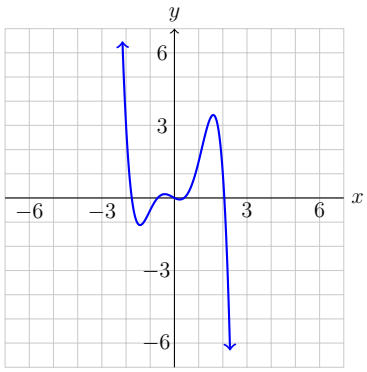
   d. $\{(1, 2), (3, 4), (5, 6), (5, 8)\}$

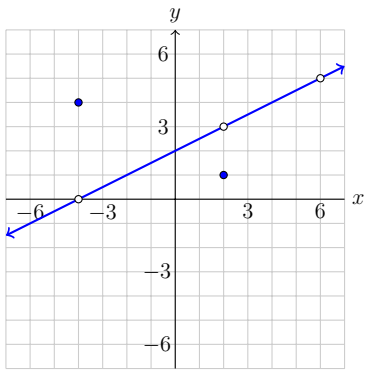
   e. $\{(1, 2), (3, 4), (6, 5), (8, 5)\}$

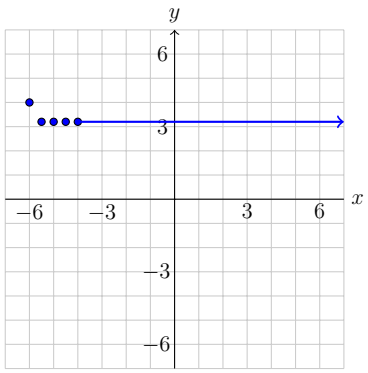
2. Which of these graphs constitute a function? Determine the domain and range of each.

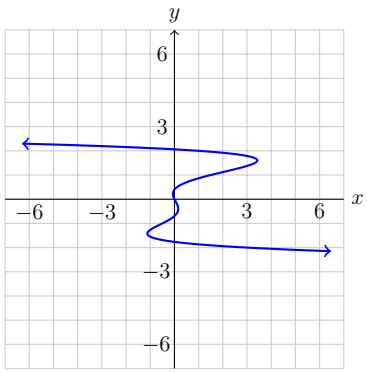
a. 

b. 

c. 

d. 

e. 

f. 

3. Which of the following equations constitute y being a function of x?

a. $2x + 3y = 5$

b. $y = \pm\sqrt{x+4}$

c. $x^2 + y^2 = 9$

d. $x = y^2$

e. $y = \dfrac{1}{x^3}$

f. $|y| = x$

g. $x = y^3$

h. $y = \sqrt{36 - x^2}$

i. $y = x^5$

j. $y = |x|$

k. $y = \dfrac{x+2}{4-x}$

l. $y = \sqrt[8]{x}$

4. Of the above equations, do any constitute x being a function of y?

5. Determine whether the following tables constitute a function. Determine the domain and range of each.

a.

x	2	4	6	8	-2
y	4	-13	13	6	-11

b.

x	-4	-3	-2	-3	-1
y	-8	4	-14	19	0

6. Could either of the above tables constitute x as a function of y? What is the domain and range if we think of the inputs as y-values and the outputs as x-values?