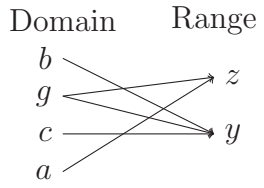
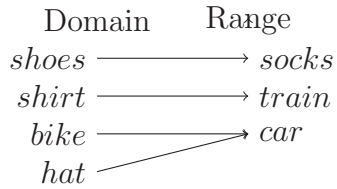
Math 111 WS 1, Function Introduction

Name: _____

1. Determine which of the following relations are considered functions. Justify your answers!

   a. $\{(3,2),(-5,1),(3,7),(4,8)\}$

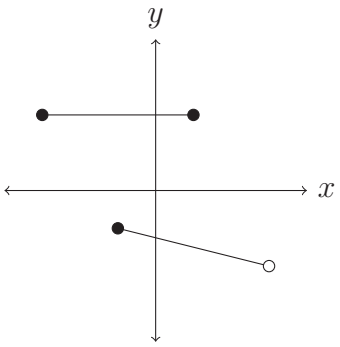
   b.
   

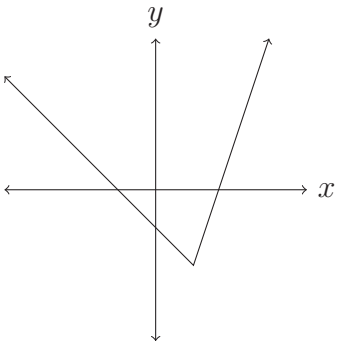
   c.
   

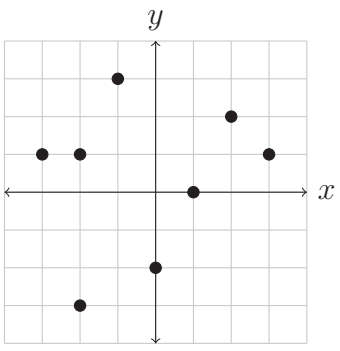
   d.

x	y
-3	2
-2	1
-1	0
0	1
1	2

   e. $\{(-1,a),(6,b),(-4.2,b),(3,a)\}$

   f.
   

   g.
   

   h.
   

2. Given the following functions, perform the indicated evaluations.

x	$f(x)$
-29	-2
-10	-1
-3	0
-2	1
-1	2
6	3
25	4

$$g(x) = \frac{5}{3x-4}$$

$$h(x) = 2\sqrt{3x-1}$$

$$j(x) = 6\left(\frac{3}{x} + \frac{x}{5}\right)$$

$$k(x) = -2\left|\frac{3}{5}x + \frac{1}{3}\right| - 2$$

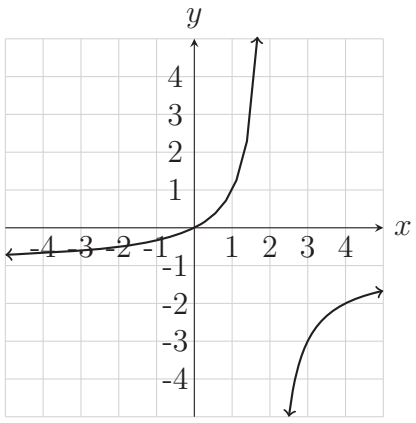


Figure 1: $y = m(x)$

a. $f(3)$

b. $g(-4)$

c. $m(3)$

d. $j(2)$

e. $k(2)$

f. $g\left(\frac{4}{3}\right)$

g. $h(0)$

h. $g\left(\frac{1}{2}\right)$

i. $j\left(\frac{3}{5}\right)$

3. Determine the domains and ranges of the following radical functions.

a. $f(x) = \sqrt{x+5}$

b. $g(x) = \sqrt{2x-8}$

c. $h(x) = 3\sqrt{3x+1} - 2$

d. $j(x) = 2\sqrt{\frac{1}{2}x - \frac{3}{5}} + 1$

4. Determine the domains and ranges of the following rational functions.

a. $f(x) = \frac{3}{x-2}$

c. $h(x) = \frac{5}{x^2 - 5x + 6}$

b. $g(x) = \frac{2x-1}{3x+2}$

d. $j(x) = \frac{2x-1}{2x^2 - 5x - 3} + 5$

5. Determine the domains and ranges of the following functions.

a. $f(x) = \frac{1}{\sqrt{2x+6}}$

b. $g(x) = 3x^2 + 5x - 4$

c. $h(x) = \dfrac{2x-5}{\sqrt{3x-\frac{1}{4}}}$

d. $j(x) = \dfrac{\sqrt{x+1}}{3x-6}$

6. Consider the function $y = quadrat(p) = p^2 + \dfrac{1}{p}$.

a. What is the name of the function?

b. What is the independent variable?

c. What is the dependent variable?

d. What is the image of 3?

e. What is the value of *quadrat* at 2?

f. What is the domain of *quadrat*?

g. What is the range of *quadrat*?

h. Give a verbal description of *quadrat*?

7. Consider the function $y = alg(x) = \sqrt{x-3} + 3x - 1$.

a. What is the name of the function?

b. What is the independent variable?

c. What is the dependent variable?

d. What is the image of 0?

e. What is the value of *alg* at 7?

f. What is the domain of *alg*?

g. What is the range of *alg*?

h. Give a verbal description of *alg*?

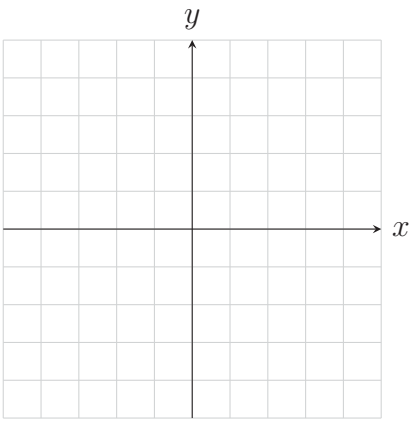
8. Determine if the equation $y = 2x - 5$ defines y as a function of x.

9. Determine if the equation $x^2 + y^2 = 1$ defines y as a function of x.

10. Create a table of points for the given functions and then graph the functions in the space provided.

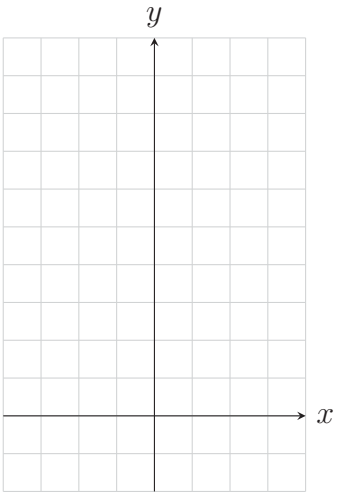
    a. $lin(x) = x$

x	$y = lin(x)$



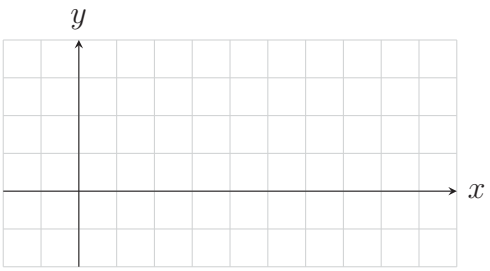
    b. $sqr(x) = x^2$

x	$y = sqr(x)$



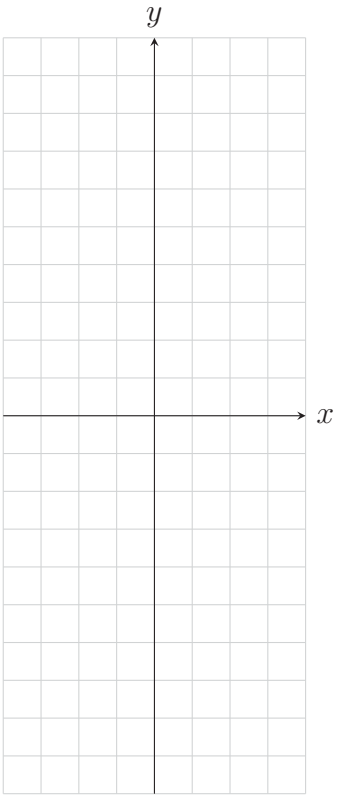
c. $sqrt(x) = \sqrt{x}$

x	$y = sqrt(x)$



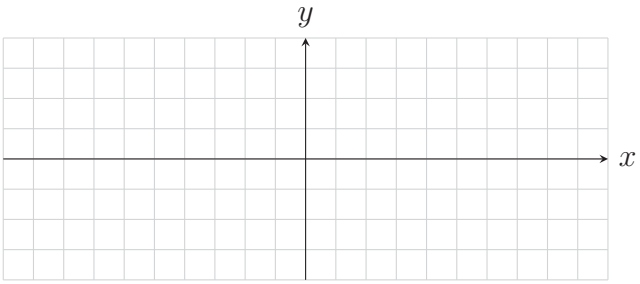
d. $cube(x) = x^3$

x	$y = cube(x)$



e. $cubert(x) = \sqrt[3]{x}$

x	$y = cubert(x)$



f. $rat(x) = \dfrac{1}{x}$

x	$y = rat(x)$