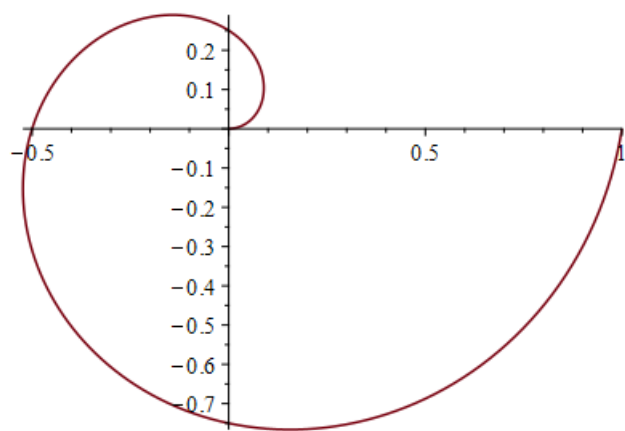# Homework 3

1. For each of the following relations, determine whether or not it is a function. Explain why.

   (a) The relation between people and their dates of birth.

   (b) The relation between phone numbers and security numbers.

   (c) The relation between EOU students and their Student IDs.

   (d) The relation between bank customers and their credit cards.

2. Each of the following equation represents a relation between x and y. Determine whether or not y is a function of x. Explain why.

   (a) $2x + 3y = 4$

   (b) $x^3 + y^3 = 4$

   (c) $y^2 = x^3 + 3x^2$

3. Each of the graphs (a), (b), (c), (d) below represents a relation between x and y. Determine whether y is a function of x and explain why. If y is a function of x, find the domain and range of the function.
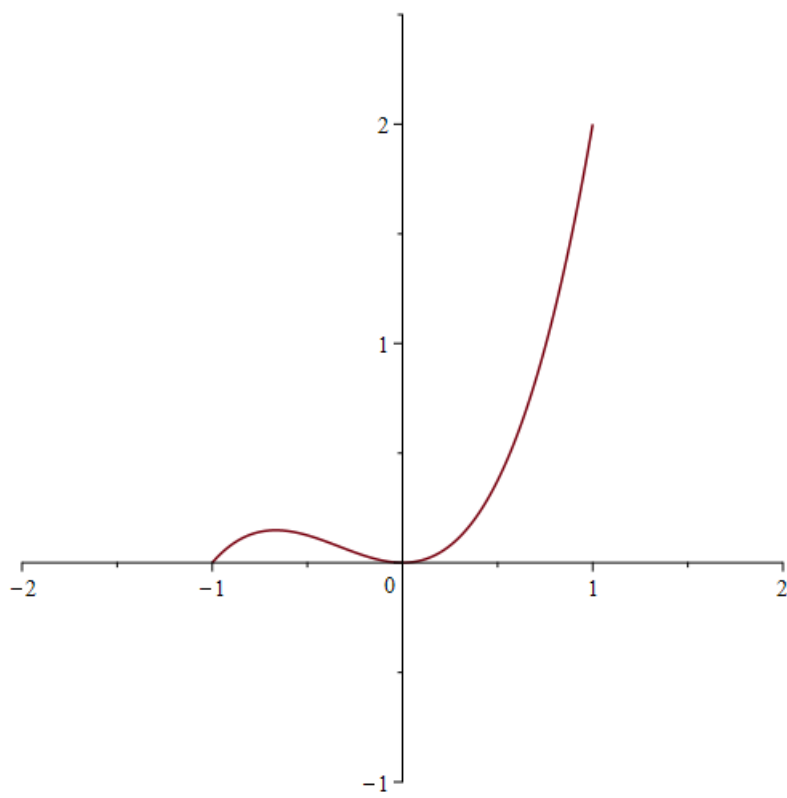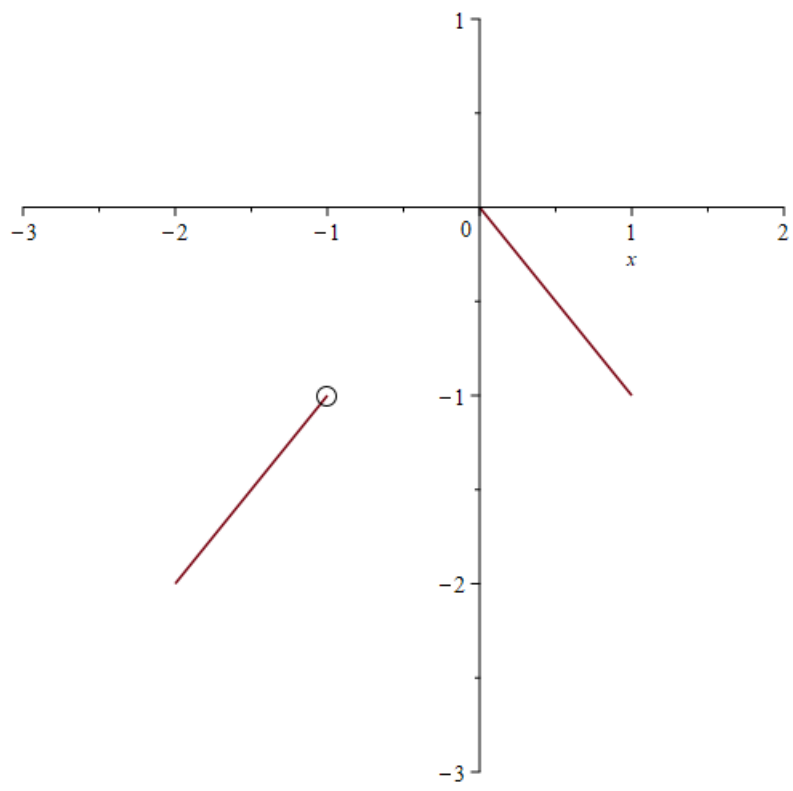

(a)
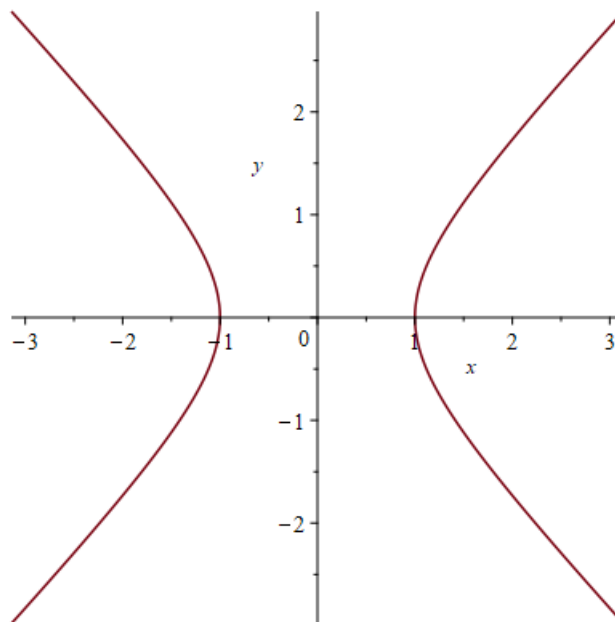
4. Find an expression for $f(x)$, state its domain, and evaluate $f(1)$, $f(2)$, $f(20)$. (This problem is similar to the exercises on page 63 which have solutions on page 69.)

   (a) f is a function that takes a real number x and perform the following three steps in the order given: (1) square; (2) add 5; (3) take the square root.

   (b) f is a function that takes a real number x and perform the following four steps in the order given: (1) divide by 3; (2) add 5; (3) take the square root; (4) make the quantity the denominator of a fraction with numerator x.

(b)

(c)

(d)