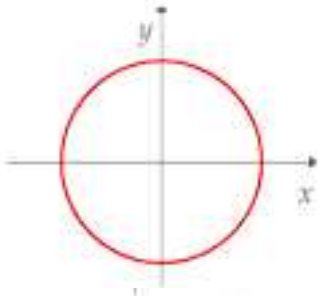
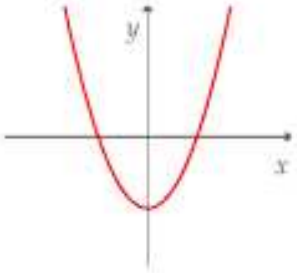
Functions and Graphs:

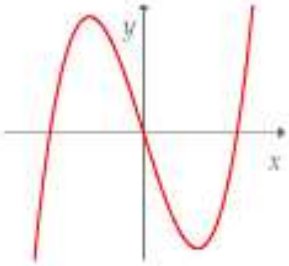
Definition: The graph of a function *f* is the set of all points (*x*, *y*) in the coordinate plane where the *x*-coordinates are the elements of the domain of *f* and where the *y*-coordinates are given by $y = f(x)$.

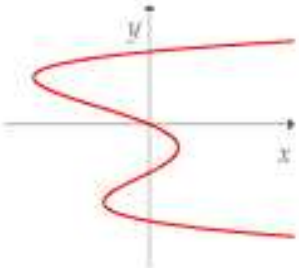
A function can have *exactly (only) one* *y*-value, called *f*(*x*), per *x*-value. One way to test a relation to see if it is a function is by using the vertical line test. That is, a vertical line can intersect a graph of a function at most once.

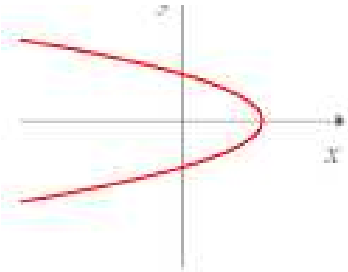
1. State whether the given graph is a function.

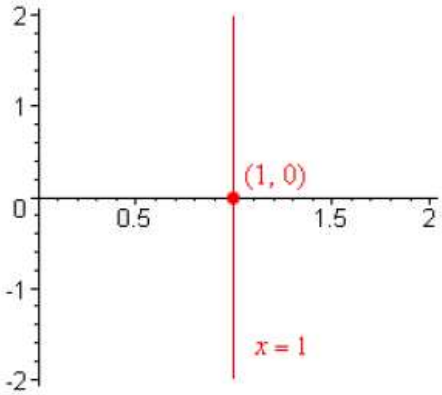




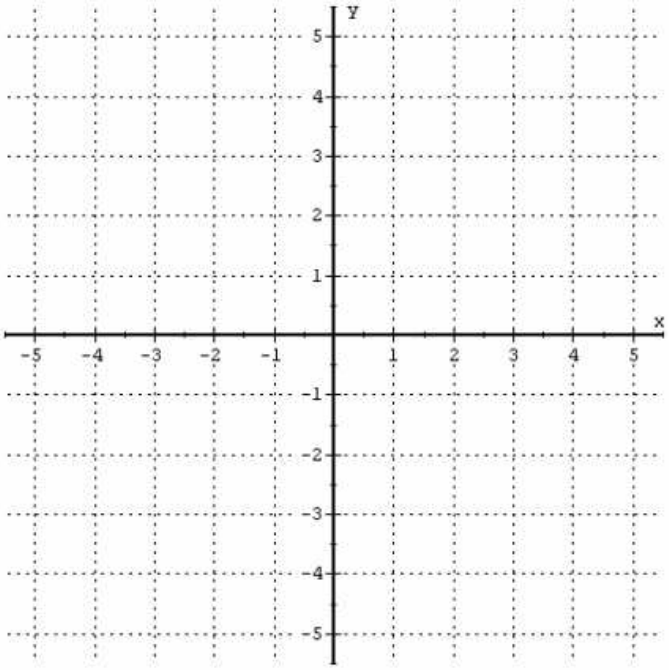




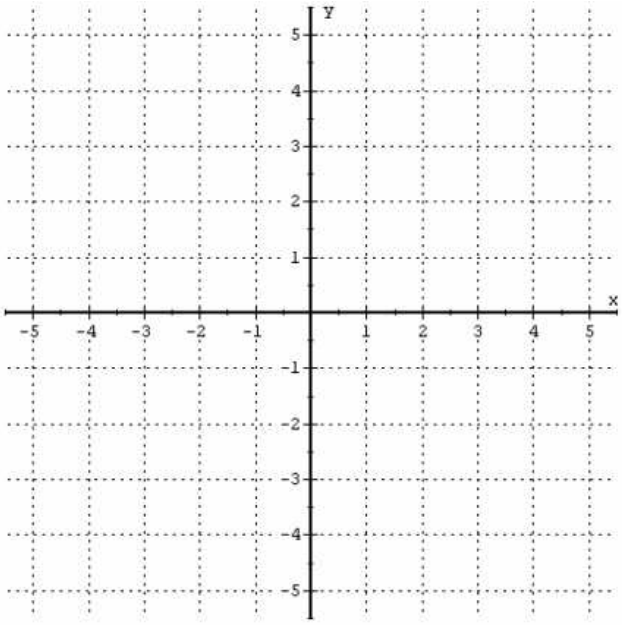




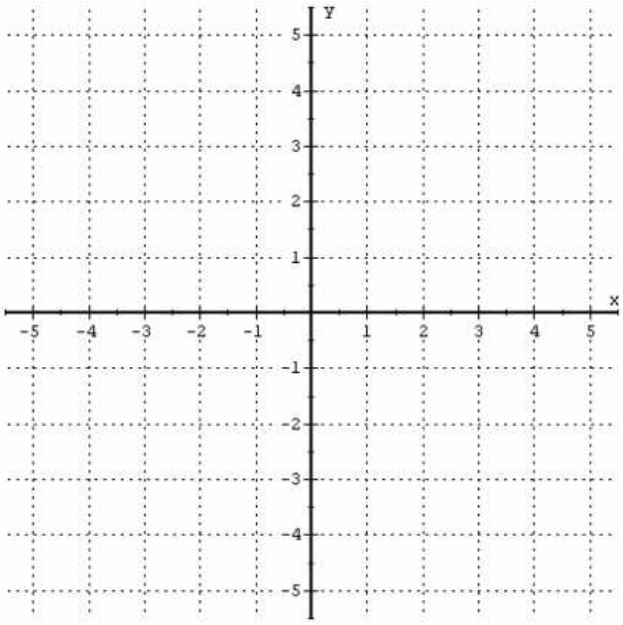
2. Sketch the graph of $y = x^2$. What is the domain?



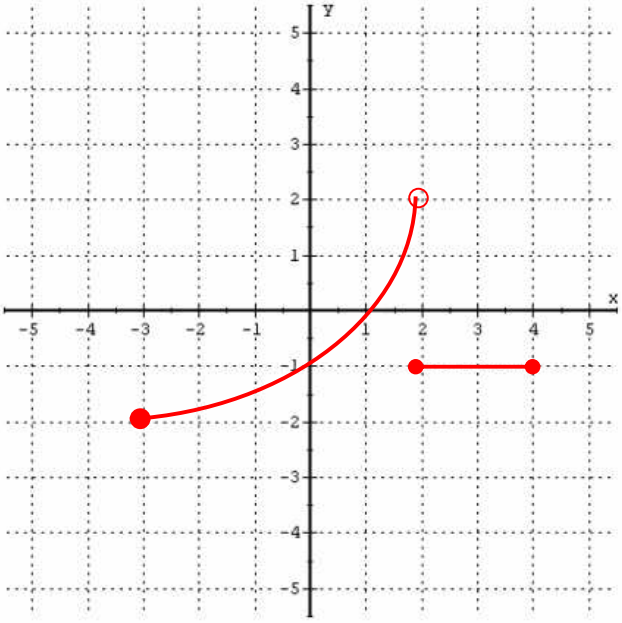
3. Sketch the graph of $y = \sqrt{x}$. What is the domain?



4. Graph the set of points {(-1, -3), (-2, 3), (3, 1), (3, 2), (0, 2)}. Determine whether the set of points represents a function.



5. Given the following graph, find:



Domain:

Range:

$f(-3) =$

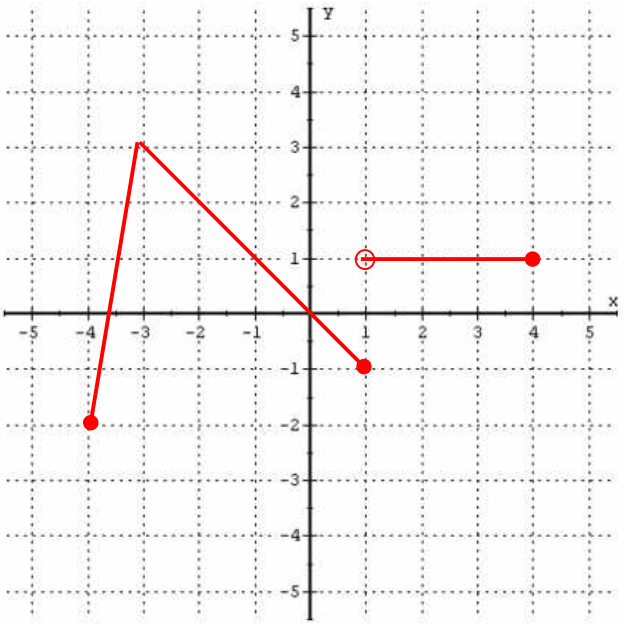
$f(0) =$

$f(1) =$

$f(2) =$

$f(3) =$

6. Given the following graph, find:



Domain:

Range:

$f(-4)$

$f(-3) =$

$f(-1) =$

$f(0) =$

$f(1) =$

$f(2) =$

$f(4) =$

7. Solve for y and determine if the given equation defines y as a function of x.

$2y + 4x = 6$

8. Solve for y and determine if the given equation defines y as a function of x.

$y^2 = x + 4$