Graphing Functions (Domain, Range, Even, Odd and Piecewise-Defined Functions)

Relation - a set of ordered pairs

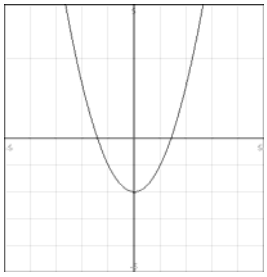
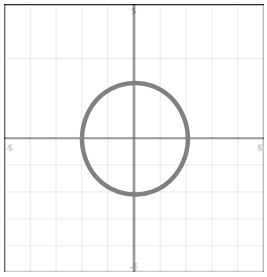
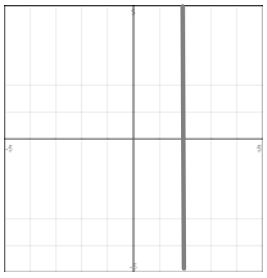
$$\{(3,-5),(5,7),(8,11),(10,11)\}$$

Function - a type of relation where each of the x coordinates are unique

Domain - the x values

Range - the y values

Vertical Line Test - used to determine if a graph represents a function

Even Function - A graph that is symmetrical with respect to the y-axis

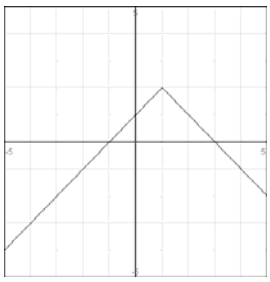
$$f(x) = f(-x)$$

Odd Function - A graph that is symmetrical with respect to the origin

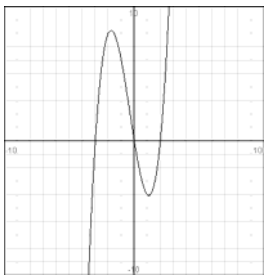
$$f(x) = -f(-x)$$

1. Find the domain and range of each and determine if each graph represents the graph of a function.

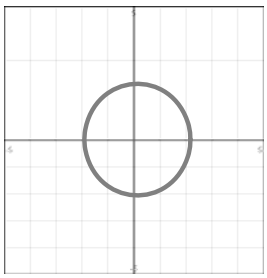
a)



b)

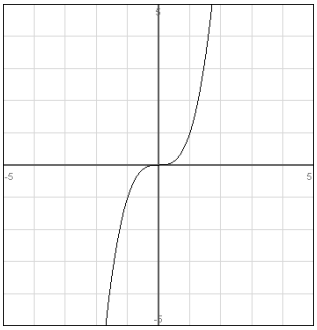


c)



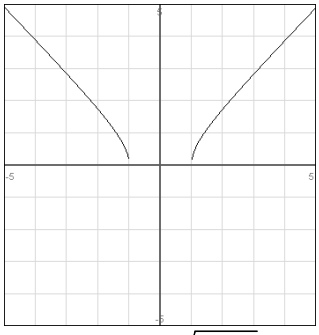
2. Determine the intervals for which the function is increasing, decreasing or constant. Determine whether the function is even, odd or neither.

a)



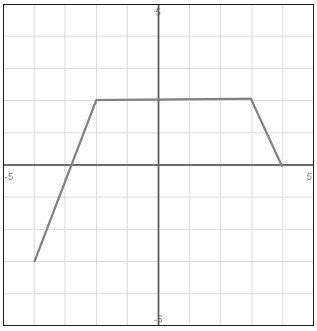
$f(x) = x^3$

b)



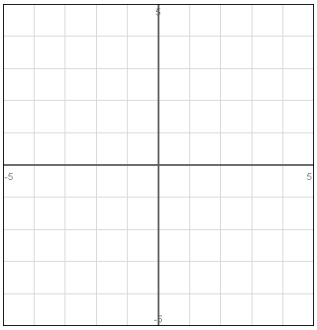
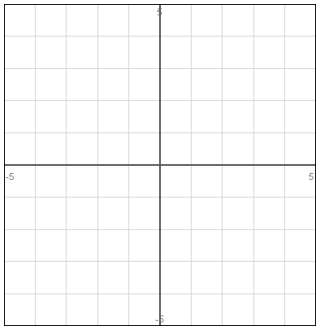
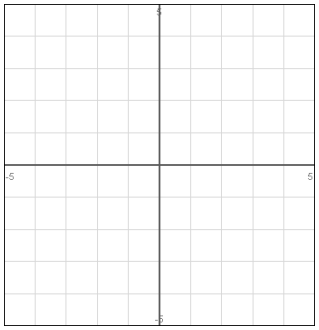
$f(x) = \sqrt{x^2 - 1}$

c)



3. Graph each piecewise-defined function.

a) $f(x)=\begin{cases}2x+1, & x\le -1\\ x^2-2, & x>-1\end{cases}$

b) $f(x)=\begin{cases}1-(x-1)^2, & x\le 2\\ \sqrt{x-2}, & x>2\end{cases}$