

1.2-1.6 Concepts Worksheet

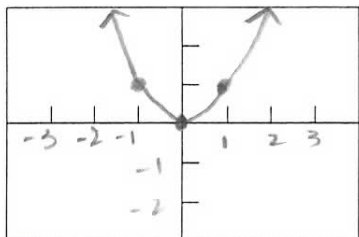
Graphical Analysis

Chapter 1 deals with functions and their graphical characteristics. To facilitate a study of functions, it is important to visualize mentally the graph of a function when given an algebraic description.

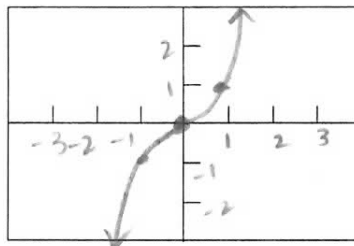
Note: Put your calculator in Radian Mode to graph the trig functions.

1. Graph each function. Clearly indicate units on the axes provided.

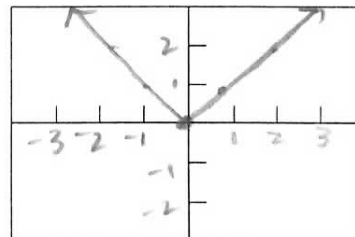
(a) $f(x) = x^2$



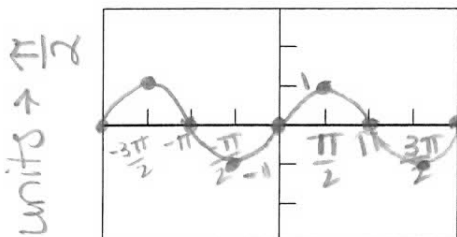
(b) $f(x) = x^3$



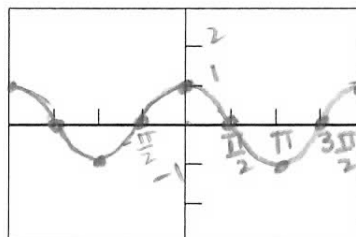
(c) $f(x) = |x|$



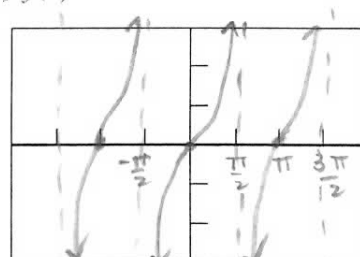
(d) $f(x) = \sin x$



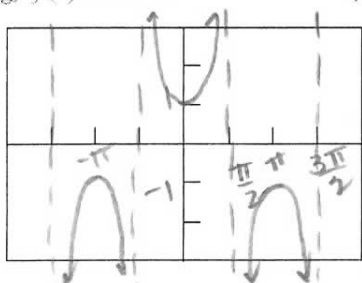
(e) $f(x) = \cos x$



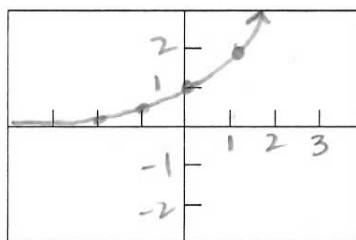
(f) $f(x) = \tan x$



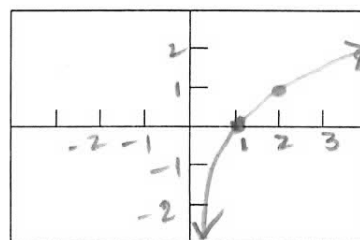
(g) $f(x) = \sec x$



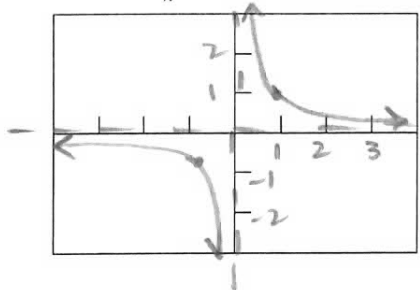
(h) $f(x) = 2^x$



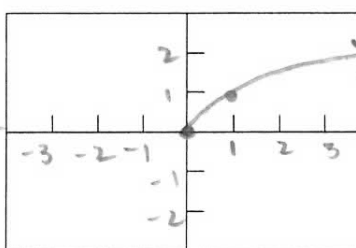
(i) $f(x) = \log_2 x$



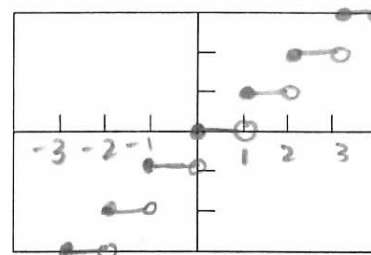
(j) $f(x) = \frac{1}{x}$



(k) $f(x) = \sqrt{x}$



(l) $f(x) = [x]$



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2. Answer the following questions about the indicated functions. In completing the table below, you may use the following abbreviations, R : the set of real numbers, J : the set of integers, and N : the set of natural numbers. Note: This exercise may need to be done as appropriate sections of Chapter 1 are completed.

Function	Domain	Range $y = f(x)$	Zeros (Find x when $f(x) = 0$)	Symmetry with respect to y -axis or origin	Even or Odd Function— $f(-x) = f(x)$ or $f(-x) = -f(x)$	Is the function periodic? If so, state the period.	Is $f(x)$ a one-to-one function? (For each $f(x)$ only one x exists)
(a) $f(x) = x^2$	\mathbb{R}	$[0, \infty)$	$x = 0$	y -axis	even	\emptyset	no
(b) $f(x) = x^3$	\mathbb{R}	\mathbb{R}	$x = 0$	origin	odd	\emptyset	yes
(c) $f(x) = x $	\mathbb{R}	$[0, \infty)$	$x = 0$	y -axis	even	\emptyset	no
(d) $f(x) = \sin x$	\mathbb{R}	$[-1, 1]$	$\pi + \pi k$	origin	odd	2π	no
(e) $f(x) = \cos x$	\mathbb{R}	$[-1, 1]$	$\frac{\pi}{2} + \pi k$	y -axis	even	2π	no
(f) $f(x) = \tan x$	$x \neq \frac{\pi}{2} + \pi k$	\mathbb{R}	$\pi + \pi k$	origin	odd	π	no
(g) $f(x) = \sec x$	$x \neq \frac{\pi}{2} + \pi k$	$(-\infty, -1] \cup [1, \infty)$	none	y -axis	even	2π	no
(h) $f(x) = 2^x$	\mathbb{R}	$(0, \infty)$	none	neither	neither	\emptyset	yes
(i) $f(x) = \log_2 x$	$(0, \infty)$	\mathbb{R}	$x = 1$	neither	neither	\emptyset	yes
(j) $f(x) = \frac{1}{x}$	$(-\infty, 0) \cup (0, \infty)$	$(-\infty, 0) \cup (0, \infty)$	none	origin	odd	\emptyset	yes
(k) $f(x) = \sqrt{x}$	$[0, \infty)$	$[0, \infty)$	$x = 0$	neither	neither	\emptyset	yes
(l) $f(x) = x $	\mathbb{R}	$\{y \mid y \in \mathbb{Z}\}$	$x = 0$	neither	neither	\emptyset	no