

# Concepts Worksheet 1

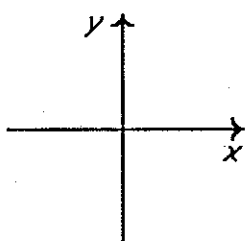
## Chapter 1 For use after Article 1.4.

### Graphical Analysis

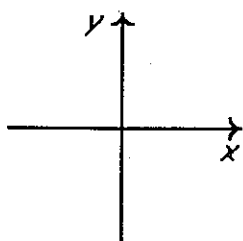
Chapter 1 deals with functions and their characteristics. To facilitate a study of functions, it is important to visualize mentally the graphical image of a function when given an algebraic description.

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

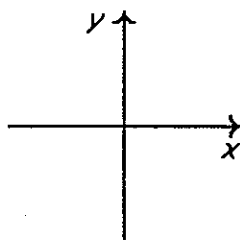
1.  $f(x) = x$



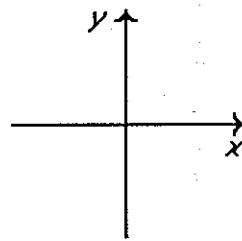
2.  $f(x) = x^2$



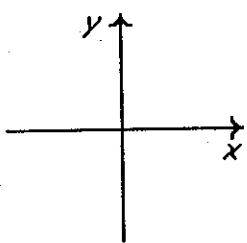
3.  $f(x) = x^3$



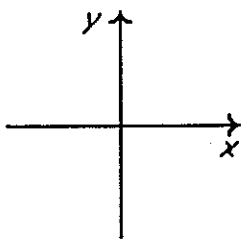
4.  $f(x) = |x|$



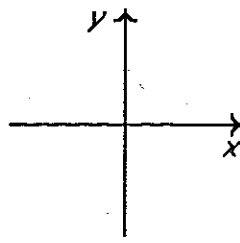
5.  $f(x) = \ln x$



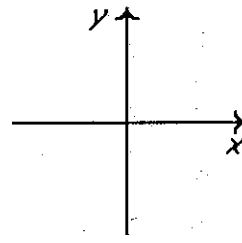
6.  $f(x) = \sin x$



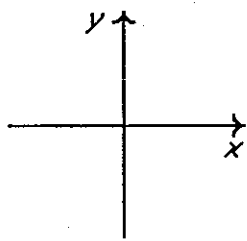
7.  $f(x) = \cos x$



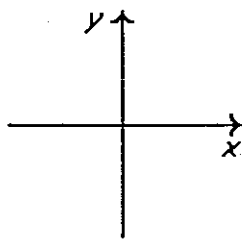
8.  $f(x) = \tan x$



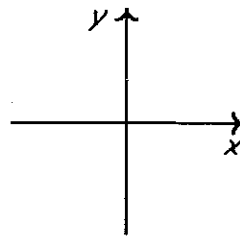
9.  $f(x) = \sec x$



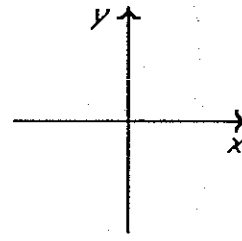
10.  $f(x) = 2^x$



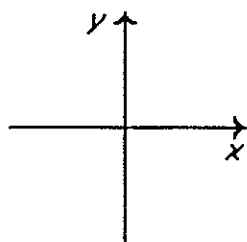
11.  $f(x) = \log_2 x$



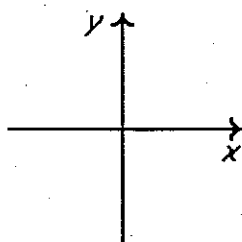
12.  $f(x) = \frac{1}{x}$



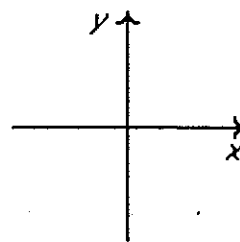
13.  $f(x) = \frac{1}{x^2}$



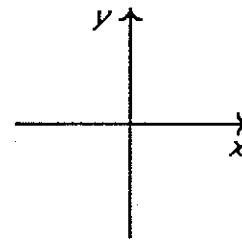
14.  $f(x) = \sqrt{x}$



15.  $f(x) = \sqrt{a^2 - x^2}$



16.  $f(x) = e^x$



## II. Graphical Analysis

- II. Answer the following questions about the indicated functions. In completing the table below 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 $y = f(x)$	Roots (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 mapping? (For each $f(x)$ only one $x$ exists)	State the $x$ coordinates of any points of discontinuity
1. $f(x) = x$								
2. $f(x) = x^2$								
3. $f(x) = x^3$								
4. $f(x) =  x $								
5. $f(x) = \ln x$								
6. $f(x) = \sin x$								
7. $f(x) = \cos x$								
8. $f(x) = \tan x$								
9. $f(x) = \sec x$								
10. $f(x) = 2^x$								
11. $f(x) = \log_2 x$								
12. $f(x) = 1/x$								
13. $f(x) = 1/x^2$								
14. $f(x) = \sqrt{x}$								
15. $f(x) = \sqrt{a^2 - x^2}$								
16. $f(x) = e^x$								

### III. Concept Connectors

1. Is there a relationship between symmetry in a function's graph and the function's being even or odd?

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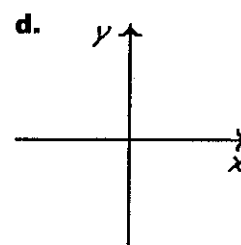
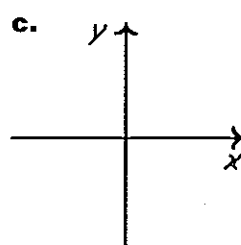
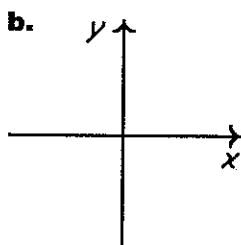
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2. Draw a reflection of a)  $f(x) = [x]$ , b)  $f(x) = \sin x$ , c)  $f(x) = 2^x$  and d)  $f(x) = \sqrt{x}$  across the line  $y = x$ . Which of the reflected images are

functions? \_\_\_\_\_



3. Is there a characteristic of a function that assures that its reflection across the line  $y = x$  is a function?

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