

Worksheet 1

ALL work must be shown for solutions of problems submitted for group classwork.

PART I - Sections 1.1, 1.2, 1.3

Section 1.1

Problem 1. Find the domain of each of the following functions:

$$(a) f(x) = \frac{1}{\sqrt[4]{x^2 - 5x}}, \quad (b) g(x) = \frac{1}{\sqrt[5]{x^2 - 5x}}.$$

Please state your answer in set or interval notation.

Problem 2. Which of the following equations define y as a function of x ? Please explain your answer. You may draw the graph of the equation (use the VLT) or use a table to support your answer, for example.

$$(a) 3x^2 - 2y = 5, \quad (b) 2x - |y| = 0.$$

Problem 3.

(a) Sketch the graph of the piecewise function

$$p(x) = \begin{cases} 3 & \text{if } x \leq -1 \\ x + 1 & \text{if } -1 < x \leq 3 \\ -x^2 & \text{if } 3 < x. \end{cases}$$

(b) State the domain and range of the function p using set or interval notation.

Sections 1.2 & 1.3

Problem 4.

(a) Is the function

$$f(x) = 2 - (x + 1)^2.$$

a power function, root function, polynomial (state its degree), rational function, algebraic function, or a trigonometric function?

(b) Sketch a graph of the function f , not by plotting points, but identifying

(i) which standard graph it is a transformation of,

(ii) then applying the appropriate transformations.

Problem 5.

(a) Is the function

$$h(\theta) = -\sin(\theta - \pi/2).$$

a power function, root function, polynomial (state its degree), rational function, algebraic function, or a trigonometric function?

(b) Sketch a graph of the function f , not by plotting points, but identifying

(i) which standard graph it is a transformation of,

(ii) then applying the appropriate transformations.

Problem 6. Jacqueline leaves Detroit at 2:00 P.M. and drives at a constant speed, traveling west on I-90. She passes Ann Arbor, which is 40 mi (miles) from Detroit, at 2:50 P.M.

(a) Find a linear function d that models the distance (in miles) she has traveled after t minutes.

(b) Draw a graph of d . What is the slope of this line?

(c) At what speed (in mi/hr) is Jacqueline traveling?