

# 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

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

(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.