

MA161 SEMESTER 1, CALCULUS: PROBLEM SHEET 2

1. Solve the following inequality:

$$|2x + 5| + 20 \geq 25$$

2. Find the largest possible domain of the following functions:

(a) $f(x) = \frac{x}{3x - 1}$

(b) $f(x) = \frac{1 + x}{x^2 - 3x + 2}$

(c) $f(x) = \sqrt{4 - x^2}$

(d) $f(x) = \sqrt{x} + \sqrt{4 - x}$

3. Find the largest possible domain and range for the following functions and sketch them:

(a) $f(x) = |x + 4|$

(b) $f(x) = |x| + 4$

(c) $f(x) = \begin{cases} x + 9, & \text{if } x < -3, \\ -2x, & \text{if } -3 \leq x \leq 3, \\ -6, & \text{if } x > 3. \end{cases}$

(d) $f(x) = \sqrt{x + 6}$

4. The following graph is that of a cubic polynomial with equation

$$f(x) = K(x - a)(x - b)(x - c).$$

Find a , b , c , and K .

