

- Show all your work for each problem; show enough work to fully justify your answer.
- Simplify all answers as far as possible.

Define the function f by

$$f(x) = \begin{cases} \frac{x^2 - x - 20}{x - 5} & \text{if } x > 4, \\ 9 & \text{if } x = 5, \\ 2x & \text{if } 1 < x < 4, \\ 3 - x & \text{if } 0 < x \leq 1. \end{cases}$$

(a) [Points: 5] What is the domain of f ? What is the range of f ?

(b) [Points: 20] Find all points at which f is discontinuous. Explain why it is discontinuous there and why it is continuous everywhere else.