

# Joseph Curtis.

## MATH1013 Lab Worksheet No. 2

### Question 1

Find all values of  $x$  for which the following functions are continuous.

(a)  $f(x) = \sqrt{2x-3} + x^2$

When  $x$  is less than 1.5 there is a square root of a negative number and the function is therefore undefined at that point.

$f(x)$  is continuous for all  $x \geq 1.5$ ,  $x \in [1.5, \infty)$

(b)  $f(x) = \frac{5}{x^3 - x^2}$

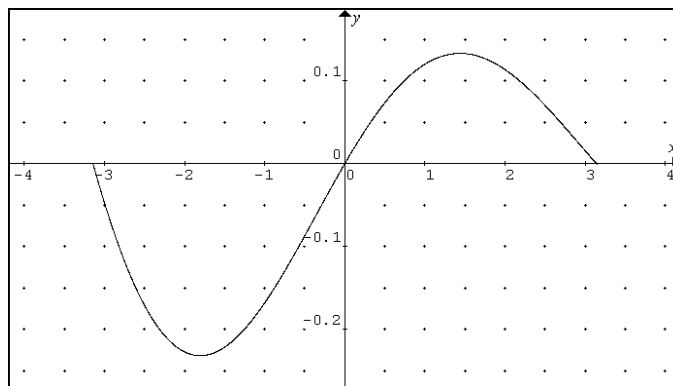
Factorise the denominator.

$$f(x) = \frac{5}{x^2(x-1)}$$

If either  $x^2$  or  $(x-1)$  is equal to zero then the function becomes undefined at that point. This occurs when  $x = 0$  and also when  $x = 1$ . Therefore the function is continuous at  $x < 0$ ,  $0 < x < 1$  and  $x > 1$ .  $x \in (-\infty, 0) \cup (0, 1) \cup (1, \infty)$ .

### Question 2

- (a) Use a graphing utility to find the maximum and minimum values of the function  $\frac{\sin x}{6+x}$  on  $[-p, p]$ .



*Maximum* = (1.437, 0.133)

*Minimum* = (-1.805, -0.232)