



# United International University

School of Science and Engineering

Mid Assessment Trimester: Fall - 2020

Course Title: Fundamental Calculus

Course Code: Math 1151 Marks: 20 Time: 1 Hour

**Q1. (a) Sketch the graphs and find the domain and range of the following functions:** [4]

(i)  $y = \frac{1}{3-x} - 2$

(ii)  $y = \sqrt{1-x} - 2$

**(b) Determine whether the following functions are one to one or many to one. Find the inverse of each function (if possible) and plot them in the same graph:** [4]

(i)  $f(x) = -|x + 5|$

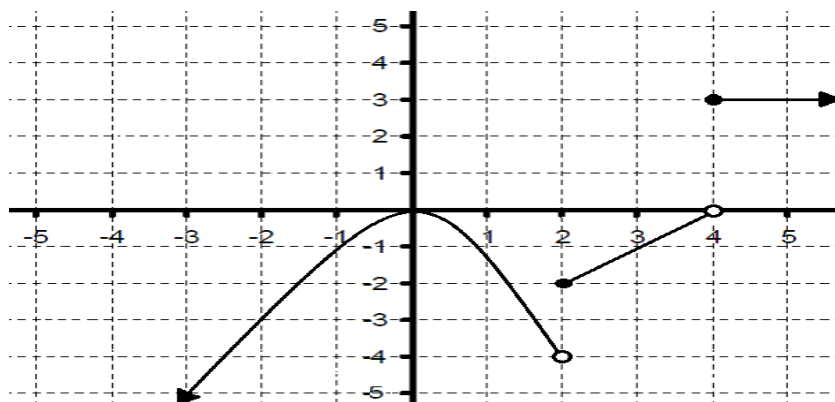
(ii)  $f(x) = \sqrt{x-2}$

**(c) Determine whether the following functions are even, odd or neither.** [2]

(i)  $y = \sqrt[3]{x} - 2$

(ii)  $y = x^2 + 6$

**Q2.** Given the graph of the function  $y = f(x)$ . [6]



From the figure write the answers of the following questions:

(i)  $\lim_{x \rightarrow 2} f(x)$

(ii)  $\lim_{x \rightarrow 3} f(x)$

(iii)  $f(2), f(5)$

(iv) Is the function  $f(x)$  continuous at  $x = -2$  and  $x = 4$ ? Explain.

**Please Turn Over**

**Q3.**

Consider the function  $y = x^2 + 7x - 1$

**[4]**

- (i) Find the average rate of change of  $y$  with respect to  $x$  over the interval  $[-3, 3]$ .
- (ii) Find the instantaneous rate of change of  $y$  with respect to  $x$  when  $x = 2$ .