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

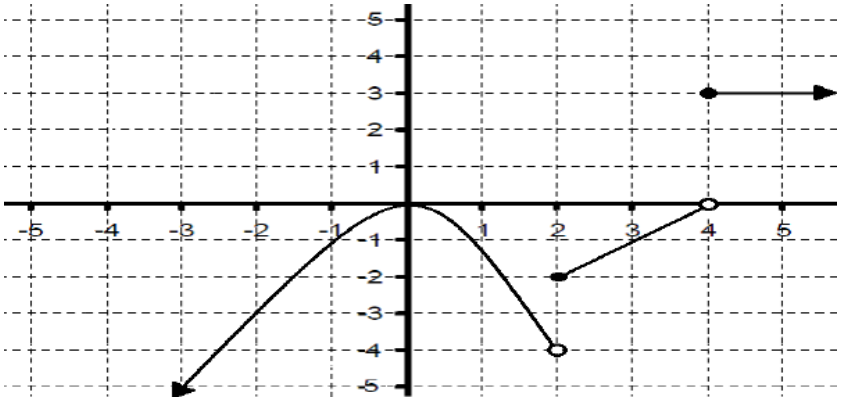
(ii) $f(x) = \sqrt{x-2}$

(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) $\lim_{x \to 2} f(x)$

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

(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 $\boldsymbol{y = x^2 + 7x - 1}$ **[4]**

(i) Find the average rate of change of $\boldsymbol{y}$ with respect to $\boldsymbol{x}$ over the interval $[\boldsymbol{-3, 3}]$.

(ii) Find the instantaneous rate of change of $\boldsymbol{y}$ with respect to $\boldsymbol{x}$ when $\boldsymbol{x = 2}$.