



United International University
School of Science and Engineering
Mid-term Examination Trimester: Fall 2019
Course Title: Fundamental Calculus (CSE)
Course Code: Math 1151 Marks: 30 Time: 1hr 45 min

Answer all questions.

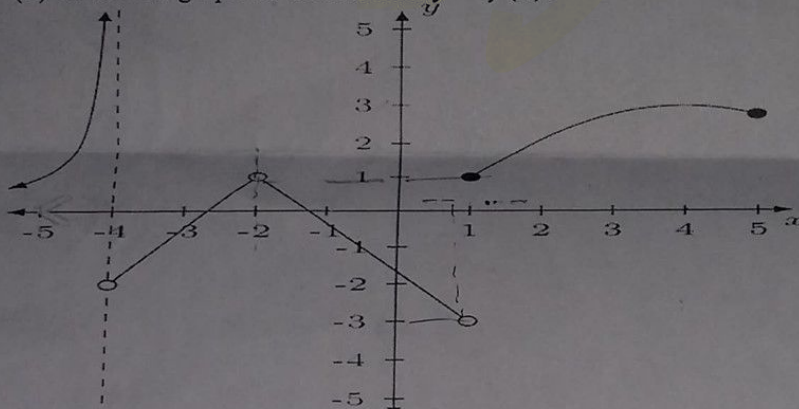
1. Draw the graph of the following functions and find their domain and range. [10]

(a) $y = 4 - \sqrt{2 - x}$
(b) $y = -(x - 5)^2 + 1$
(c) $y = \frac{1}{2-x} - 1$
(d) $y = -|x - 1| - 4$

2. (a) Determine whether following functions are one to one, or many to one. Find the inverse of each functions (if possible). [4]

i) $f(x) = (1 - x)^3$ ii) $f(x) = 1 - 10^x$

- (b) Given the graph of the function $y = f(x)$. [3]



From the figure write the answers of the following questions:

(i) $\lim_{x \rightarrow 1} f(x)$ → DNE
(ii) $\lim_{x \rightarrow -2} f(x)$ → 1
(iii) $f(-2), f(1)$ → 1

- (c) Show that $y = 3 + |x|$ is continuous at $x = 0$. [3]

3. (a) Consider a function $f(x) = x^2 + 2x + 1$ [8]

- i) Find the slope at $x = x_0$ of the given function.
ii) Find the equation of tangent line to the graph of function at $x = 1$.
iii) Find the average rate of change of function in the interval $[-1, 1]$
iv) Draw the graph of $f(x)$ with tangent line at $x = 1$.

- (b) In each part, classify the function as even, odd, or neither [2]

i) $y = \sqrt[3]{x-1}$ ii) $y = \frac{1}{x}$

↑
N

↓
odd

$2x+2$