



Name:

ID:

Mid1 -- Math 211- First Semester - 1447 H

Time: 1h 30 min

Marks: 25

Question 1: Choose the correct answer:

(1) If $Z_1 = 1 + 2i$, $Z_2 = 1 - 2i$ then $\overline{Z_1 \cdot Z_2}$ equal to: (1.5)

- a) -5 b) 13 c) -2 d) 5

(2) $\frac{1-3i}{1+i}$ equal to: (1.5)

- a) $\frac{3-i}{2}$ b) $\frac{3+3i}{2}$ c) $-1 - 2i$ d) $\frac{1+i}{2}$

(3) $\log(27)$ equal to: (1)

- a) $\frac{3 \ln 9}{\ln 10}$ b) $\frac{3 \ln 3}{\ln 10}$ c) $\frac{2 \ln 9}{\ln 10}$ d) $\frac{3 \ln 7}{\ln 10}$

(4) The domain of $y = \ln(27 - 3x)$ is: (1.5)

- a) $(-\infty, 9)$ b) $[9, +\infty)$ c) $(-\infty, 9]$ d) $(9, +\infty)$

(5) $e^{3 \ln e}$ equals to (1)

- a) e^{3e} b) 1 c) e d) e^3

6) The solution of the equation: $\ln(x^2 - 1) - \ln(2x - 1) + \ln 2 = 0$ is:

- a) $\frac{1+\sqrt{2}}{6}$ b) $\frac{1-\sqrt{3}}{4}$ c) 1 d) $\frac{1+\sqrt{3}}{2}$ (1.5)

7) The solution of the equation $e^{2x} - 2e^x - 3 = 0$ is: (1.5)

- a) 3 b) $\ln 3$ c) -1 d) 1

8) If $f(x) = (1 + x^2)^4$ then $f'(-1)$ equals to: (1.5)

- a) 8 b) 64 c) -64 d) -8

Question 2 :

A) Find all the solutions of the equations:

i) $x^2 - 2x + 5 = 0$ (1.5)

ii) $\frac{x+3}{x-1} = \frac{4}{x+1} + \frac{5}{x^2-1}$ (2)

B) Solve in R the following equation $3^{x-5} = 5$ (1)

C) Find the derivative of the following functions

i) $f(x) = \frac{1}{3}x^6 - 9x^{\frac{1}{3}} + \sqrt{2x-1} - \frac{1}{x^2}$ (1.5)

ii) $f(x) = x^2 e^{-3x^3}$ (1.5)

iii) $f(x) = \frac{\cot x}{1+\cos x}$ (1.5)

iv) $f(x) = [\ln(x^2 + 1)^4]^2$ (1.5)

v) $f(x) = 5^{\tan x}$ (1)

vi) $f(x) = \frac{e^{x^2} x^{\frac{1}{3}}}{(x^2-1)^2 (2x-1)^3}$ (2.5)