

$$-\sqrt{1 + \frac{x}{2}}$$

[5]

4. Use sandwich theorem (else you would lose marks) to evaluate the following limit

$$\lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2}$$

[7]

5. Evaluate the following limit (avoid using L.Hopital Rule else you would lose marks)

$$\lim_{x \rightarrow 0} \frac{\sqrt[3]{1+x} - 1}{x}$$

[8]

6. Graph the given rational function. Include the graphs and equations of all the asymptotes.

$$y = \frac{2x}{x+1}$$

[5]

7. Given a function $f(x)$, a point c , and a positive number ϵ . Find $L = \lim_{x \rightarrow c} f(x)$. Then find a number $\delta > 0$ such that $|f(x) - L| < \epsilon$ whenever $0 < |x - c| < \delta$.

$$f(x) = \sqrt{1 - 5x}, \quad c = -3, \quad \epsilon = 0.5$$

[10]

Good Luck

Calculus
(MT1003)

Analytical Geometry

Sessional-I Exam

Date: September 4th 2024

Course Instructor(s)

Dr. Mazhar Hussain (Moderator)

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Total Time (Hrs.): 1

Total Marks: 45

Total Questions: 7

Roll NO

Section

Student Signature

Do not write below this line

- Attempt all the questions in the given order
- Write question number on your answer with bold faced marker.

1. Three hundred books sell for \$40 each, resulting in a revenue of $(300)(\$40) = \$12,000$. For each \$5 increase in the price, 25 fewer books are sold. Write the revenue R as a function of the number x of \$5 increases.

[5]

2. Write the formula for $g \circ f$ and find its domain and range when $f(x) = 2 - x^2$ and $g(x) = \sqrt{2 + x}$.

[5]

3. Graph the given function by starting with the graph of one of the standard function and applying an appropriate transformation