



AUM

American University Of The Middle East

2020 SUMMER 2 ONLINE- MAT175-O1- ASSESSMENT 3

Name & Surname &ID:

There are 3 pages and 4 questions. To get the full credit please show all your work.

Q1] Find the given limit:

[25pts]

$$\lim_{x \rightarrow 2} \left(\frac{x^3 - 4x}{x^3 - x^2 - 2x} \right)$$

Q2] Find the given limit:

[25pts]

$$\lim_{x \rightarrow \infty} \left(\frac{6x^3 - 4x^2 + x - 1}{3x^3 - 2x^4 - 6x^2 + 2} \right)$$

Q3] Let $f(x) = \begin{cases} -2x^3 - 1 & \text{if } x < 2 \\ -2x^2 - 9 & \text{if } x > 2 \\ 17 & \text{if } x = 2 \end{cases}$ be a case-defined function. Answer the given questions.

[25 pts]

a. $\lim_{x \rightarrow 2^+} f(x)$

b. $\lim_{x \rightarrow 2^-} f(x)$

c. $\lim_{x \rightarrow 2} f(x)$

d. Is the function continuous at $x = 2$? Please explain.

Q4] Suppose that x months from now, the price of a certain model of calculator will be

$P(x) = 40 + \frac{30}{x+1}$ dollars per unit. [25pts]

- a. What will be the price 5 months from now?

- b. By how much will the price drop during the fifth month?

- c. What happens to price in the long run that is as $x \rightarrow \infty$?