



The Islamic University of Gaza

Maths. Department
Calculus A

MATHA1301

MidTerm Exam: 1 Hour

Date: 02/11/2019

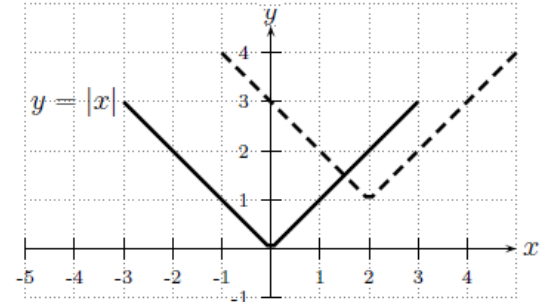
اسم الطالب	Question	1	2	3	4	Total
رقم الشعبة	Points	15	15	15	15	60
رقم الطالب	Score					

أجب على الأسئلة التالية مع ضرورة توضيح خطوات الحل كاملة لتحصل على الدرجات الكاملة

Q.I) (15 points) Choose the correct answer for each of the following:

- The curve $f(x) = \frac{x^2+2x-3}{x^2-9}$ has a vertical asymptote(s) at:
 - $x = -3$ and $x = 3$
 - $x = -3$
 - $x = 3$
 - $y = 3$
- If $f(x) = x^2 - 1$ and $g(x) = \sqrt{x+1}$, then $(g \circ f)(x) =$
 - x
 - $(x^2 - 1)\sqrt{x+1}$
 - $\sqrt{x+1} + x^2 - 1$
 - $|x|$
- The function $f(x) = x^3 + x$ is
 - Odd
 - Neither even nor odd
 - Even and Odd
 - Even
- The domain of $f(x) = \frac{x+1}{x^2-4}$ is
 - $(-\infty, -2) \cup (-2, \infty)$
 - $(-\infty, 2) \cup (2, \infty)$
 - $(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$
 - $(-\infty, -2) \cup (2, \infty)$
- As shown in the figure, the graph of the function $f(x) = |x|$ shifted two units to the right and one unit up. The formula of the new position is:

- $y = |x + 2| + 1$
- $y = |x - 2| + 1$
- $y = |x - 2| - 1$
- $y = |x + 2| - 1$



Q.II) (15 points) Evaluate the following limits

(a) $\lim_{x \rightarrow 0} \frac{8x}{3 \sin x - x}$

(b) $\lim_{x \rightarrow 0} \frac{1 - (1 - x)^2}{x}$

Q.III) (15 points) (a) Find $\frac{dy}{dx}$ if $y = \frac{x^2 + \csc x}{x \sin x}$

(b) Find the point on the curve $y = 2x^2 - 6x + 5$ at which the tangent line is perpendicular to the line $x - 2y = 1$

Q.IV) (15 points) (a) Find the domain of the function:

$$f(x) = \sqrt{x-2} + \sqrt{5-x}$$

(b) **Using the definition**, calculate the derivatives of the function:

$$f(x) = \begin{cases} x, & \text{for } x < 0 \\ \tan x, & \text{for } x \geq 0 \end{cases}$$