UNIVERSITI TEKNOLOGI MARA
ASSESSMENT 1

COURSE	**:**	**CALCULUS 1**
COURSE CODE	**:**	**MAT183**
DATE	**:**	**NOVEMBER 2021**
TIME	**:**	**2 HOURS**
NAME	**:**	_____
STUDENT'S ID	**:**	_____
LECTURER'S NAME	**:**	_____
GROUP	**:**	_____

INSTRUCTIONS TO CANDIDATES

1. This examination paper consists of two parts: **Part A and Part B.** Answer all questions.

Question	Marks
Part A	/ 15
Part B	
1	
2	
3	
4	
Total	/ 30

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ANSWER **ALL** QUESTIONS.

PART A

Find each of the following limits:

a) $\lim\limits_{x\to 3} \dfrac{3(x^2-9)}{12-4x}$

(5 marks)

b) $\lim\limits_{x\to -3} \dfrac{x+3}{\sqrt{x^2-7}-\sqrt{2}}$

(5 marks)

c) $\lim\limits_{x\to +\infty} \dfrac{\sqrt{x^2-1}}{x+2}$

(5 marks)

PART B

QUESTION 1

Evaluate the following limits:

$$\lim_{x\to 0} \frac{\tan(2x)}{3x\cos(x)}$$

(6 marks)

QUESTION 2

The function $f(x)$ is defined as follows:

$$f(x)=\begin{cases} 2x^3+x+b\,, & x\le -1 \\ \dfrac{2x+5}{3}\,, & -1<x\le 0 \\ \dfrac{9x^2+5}{3}\,, & x>0 \end{cases}$$

a) Find the value of *b* so that $\lim\limits_{x\to -1} f(x)$ exists. (3 marks)

b) Determine whether the function is continuous at $x=0$. (5 marks)

c) Find

i) $\lim_{x \to -2^-} f(x)$

ii) $\lim_{x \to 1^+} f(x)$

(2 marks)

QUESTION 3

Find the equation of the tangent line to the curve $f(x) = 8 + \sqrt{15 - 3x}$ at $x = 2$.

(6 marks)

QUESTION 4

Find the derivative of $f(x) = \dfrac{1}{(2-x)^2}$ using the definition of derivative.

(8 marks)

END OF QUESTION PAPER