

Department of Mathematical Sciences
KFUPM
Term 051

**MATH 101/ Quiz#2/ Duration=25 minutes
Code 001**

Name:

ID#:

1 [3 Marks]

The function

$$f(x) = \begin{cases} \frac{\sin(kx)}{\tan(2x)} & \text{if } x \neq 0, \\ 1 & \text{if } x = 0 \end{cases}$$

is continuous at $x = 0$ for :

- a) $k = -2$ b) $k = \pm 2$ c) $k = -1$ d) $k = 0$ e) $k = \frac{1}{2}$
f) $k = 1$ g) $k = 2$.

2 [2 Marks]

$\lim_{x \rightarrow 1} (x^2 - 1) \sin\left(\frac{1}{x^2 - 1}\right)$ is equal to :

- a) $-\infty$ b) -1 c) 0 d) $\frac{1}{2}$ e) 1 f) $+\infty$ g) DNE.

3 [5 Marks]

Use the the $\epsilon - \delta$ definition, to show that $\lim_{x \rightarrow 4} x^2 = 16$.

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**MATH 101/ Quiz#2/ Duration=25 minutes
Code 002**

Name:

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1 [3 Marks]

The function

$$f(x) = \begin{cases} \frac{\sin((k+1)x)}{\tan(3x)} & \text{if } x \neq 0, \\ 2 & \text{if } x = 0 \end{cases}$$

is continuous at $x = 0$ for :

- a) $k = -3$ b) $k = \pm 3$ c) $k = -2$ d) $k = 0$ e) $k = 2$
f) $k = 3$ g) $k = 5$.

2 [2 Marks]

$\lim_{x \rightarrow -2} (x^2 - 4) \sin\left(\frac{1}{x^2 - 4}\right)$ is equal to :

- a) $-\infty$ b) -4 c) 0 d) 1 e) 4 f) $+\infty$ g) DNE.

3 [5 Marks]

Use the the $\epsilon - \delta$ definition, to show that $\lim_{x \rightarrow 5} x^2 = 25$.

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**MATH 101/ Quiz#2/ Duration=25 minutes
Code 003**

Name:

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1 [3 Marks]

The function

$$f(x) = \begin{cases} \frac{\sin((k-1)x)}{\tan(4x)} & \text{if } x \neq 0, \\ -1 & \text{if } x = 0 \end{cases}$$

is continuous at $x = 0$ for :

- a) $k = -4$ b) $k = \pm 4$ c) $k = -3$ d) $k = -1$ e) $k = 0$
f) $k = 1$ g) $k = 4$.

2 [2 Marks]

$\lim_{x \rightarrow -3} (x^2 - 9) \sin\left(\frac{1}{x^2 - 9}\right)$ is equal to :

- a) $-\infty$ b) -9 c) 0 d) 1 e) 9 f) $+\infty$ g) DNE.

3 [5 Marks]

Use the the $\epsilon - \delta$ definition, to show that $\lim_{x \rightarrow 6} x^2 = 36$.

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Code 004**

Name: ID#:

Name: ID#:

1 [3 Marks]

The function

$$f(x) = \begin{cases} \frac{\sin((k+2)x)}{\tan(5x)} & \text{if } x \neq 0, \\ 2 & \text{if } x = 0 \end{cases}$$

is continuous at $x = 0$ for :

- a) $k = -5$ b) $k = \pm 5$ c) $k = -2$ d) $k = 0$ e) $k = 2$
f) $k = 5$ g) $k = 8$.

2 [2 Marks]

$\lim_{x \rightarrow 4} (x^2 - 16) \sin\left(\frac{1}{x^2 - 16}\right)$ is equal to :

- a) $-\infty$ b) -16 c) 0 d) 1 e) 16 f) $+\infty$ g) DNE.

3 [5 Marks]

Use the the $\epsilon - \delta$ definition, to show that $\lim_{x \rightarrow 7} x^2 = 49$.