

Department of Mathematical Sciences
KFUPM
Term 051

**MATH 101-06, 13 / Quiz#4/ Time allowed=30 minutes
Code 001**

Name:

ID#:

Exercise 1 [4 marks]

The values of a and b for which the curve $ax^3y + y^3 = b$ has the point $(1, 1)$ on its graph and the tangent line at $(1, 1)$ has the equation $3x + 4y = 7$ are equal to :

- a) $(0, 1)$ b) $(1, 2)$ c) $(-2, -1)$
d) $(2, 3)$ e) $(3, 4)$ f) $(4, 5)$ g) $(-1, 0)$.

Exercise 2 [3 marks]

If an aircraft is climbing at a 45° angle to the horizontal and if its speed is $200\sqrt{2}mi/h$, then it is gaining altitude at the rate of :

- a) $100mi/h$ b) $100\sqrt{2}mi/h$ c) $200\sqrt{2}mi/h$
d) $200mi/h$ e) $300mi/h$ f) $300\sqrt{2}mi/h$ g) $400\sqrt{2}mi/h$.

Exercise 3 [3 marks]

The local linear approximation of $(1 + \frac{x}{2})^4$ at $x = 0$ is :

- a) $2 + 2x$ b) $1 + 8x$ c) $1 + 2x$
d) $1 + \frac{x}{2}$ e) $1 - \frac{x}{2}$ f) $1 - 2x$ g) $1 + 4x$.

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Exercise 1 [4 marks]

The values of a and b for which the curve $ax^3y + 2y^3 = b$ has the point $(-1, 1)$ on its graph and the tangent line at $(-1, 1)$ has the equation $3x + 5y = 2$ are equal to :

- a) $(0, 2)$ b) $(2, 0)$ c) $(1, 1)$
d) $(-1, 3)$ e) $(3, -1)$ f) $(4, -2)$ g) $(-2, 4)$.

Exercise 2 [3 marks]

If an aircraft is climbing at a 45° angle to the horizontal and if its speed is $\frac{600}{\sqrt{2}}mi/h$, then it is gaining altitude at the rate of :

- a) $150mi/h$ b) $\frac{150}{\sqrt{2}}mi/h$ c) $300mi/h$
d) $\frac{300}{\sqrt{2}}mi/h$ e) $450mi/h$ f) $\frac{450}{\sqrt{2}}mi/h$ g) $\frac{600}{\sqrt{2}}mi/h$.

Exercise 3 [3 marks]

The local linear approximation of $(1 + \frac{x}{2})^6$ at $x = 0$ is :

- a) $6 + \frac{x}{2}$ b) $1 + 12x$ c) $1 - 3x$
d) $1 + 3x$ e) $1 - \frac{x}{2}$ f) $1 - 6x$ g) $1 + 6x$.

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Exercise 1 [4 marks]

The values of a and b for which the curve $ax^4y+y^4 = b$ has the point $(-1, -1)$ on its graph and the tangent line at $(-1, -1)$ has the equation $4x + 5y = -9$ are equal to :

- a) $(0, 1)$ b) $(1, 0)$ c) $(\frac{1}{2}, \frac{1}{2})$
d) $(2, -1)$ e) $(-1, 2)$ f) $(3, -2)$ g) $(-2, 3)$.

Exercise 2 [3 marks]

If an aircraft is climbing at a 60° angle to the horizontal and if its speed is $\frac{300}{\sqrt{3}}mi/h$, then it is gaining altitude at the rate of :

- a) $150mi/h$ b) $\frac{150}{\sqrt{3}}mi/h$ c) $300mi/h$
d) $\frac{100}{\sqrt{3}}mi/h$ e) $200mi/h$ f) $\frac{200}{\sqrt{3}}mi/h$ g) $\frac{300}{\sqrt{3}}mi/h$.

Exercise 3 [3 marks]

The local linear approximation of $(1 + \frac{x}{2})^8$ at $x = 0$ is :

- a) $8 + \frac{x}{2}$ b) $1 + 16x$ c) $1 - 4x$
d) $1 + 8x$ e) $1 - \frac{x}{2}$ f) $1 - 8x$ g) $1 + 4x$.

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Exercise 1 [4 marks]

The values of a and b for which the curve $ax^5y + y^5 = b$ has the point $(1, -1)$ on its graph and the tangent line at $(1, -1)$ has the equation $-5x + 6y = -11$ are equal to :

- a) $(-2, 1)$ b) $(1, -2)$ c) $(0, -1)$
d) $(-3, 2)$ e) $(-4, 3)$ f) $(-5, 4)$ g) $(-1, 0)$.

Exercise 2 [3 marks]

If an aircraft is climbing at a 60° angle to the horizontal and if its speed is $400\sqrt{3}mi/h$, then it is gaining altitude at the rate of :

- a) $200mi/h$ b) $200\sqrt{3}mi/h$ c) $400\sqrt{3}mi/h$
d) $400mi/h$ e) $600mi/h$ f) $300\sqrt{3}mi/h$ g) $600\sqrt{3}mi/h$.

Exercise 3 [3 marks]

The local linear approximation of $(1 + \frac{x}{3})^9$ at $x = 0$ is :

- a) $3 + 3x$ b) $1 - 27x$ c) $1 + 9x$
d) $1 + \frac{x}{3}$ e) $1 - \frac{x}{3}$ f) $1 + 3x$ g) $1 - 9x$.