

King Fahd University of Petroleum and Minerals
Department of Mathematics & Statistics
Math101.15
Semester 101
Quiz (3)

Name:

ID #:

Serial #:

1. Evaluate the following limits:

(a)
$$\lim_{h \rightarrow 0} \frac{\arccos\left(\frac{1}{2} + h\right) - \arccos\left(\frac{1}{2}\right)}{h}$$

(b)
$$\lim_{x \rightarrow 0} \frac{\sin(x) \tan(3x)}{x^3 + 2x^2}$$

2. Find the derivative of:

(a) $\frac{y}{x^3} + \frac{x}{y^3} = x^2 y^4$

(b) $y = \ln\left(\sqrt{\tan(\sin^{-1}(e^{5-4e}))}\sqrt{\ln(\arccos(\frac{1}{4\pi^2}))}\right)$

3. If the line $3x + y = b$ is tangent to the parabola $y = ax^2$ when $x = -2$, Then find $4a+b$.

4. Find all points (x, y) on the graph of $f(x) = \frac{x-1}{2-x}$ where tangent lines are perpendicular to the line $8x + 2y = 1$.

Good luck

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