

King Fahd University of Petroleum and Minerals
Math. & Stat. Departement
QUIZ # 3

Name	ID	SEC	Sr
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Q1) What is the value of c such that the line $y = 2x + 3$ is tangent to the parabola $y = c x^2$?

Q2) Find $\lim_{x \rightarrow 2} \left(\frac{x^2 + x - 6}{\sin(x-2)} + \frac{\tan\left(\frac{\pi x}{8}\right)}{x} \right)$

Q3) Find all values of m and b for which the function $f(x) = \begin{cases} x^2, & x \leq -1 \\ mx + b, & x > -1 \end{cases}$ is differentiable everywhere.

Q4) Assume that both $f(x)$ and $g(x)$ are differentiable functions of x and

$f(4) = -2, g(4) = 3, f'(4) = \frac{-1}{3}, g'(4) = -3, f''(4) = -1, g''(4) = \frac{-1}{2}$, then find

$$\lim_{h \rightarrow 0} \frac{f(4+h)g'(4+h) + 3f(4)}{h}$$

Q5) If $y = h(2f^3(\sqrt{x})g(x))$, then find $\frac{dy}{dx}$

Q6) Find the number of points for which the function $f(x) = ||x^2 - 4| - 3|$ is not differentiable.