

King Fahd University of Petroleum and Minerals  
Math. & Stat. Departement  
QUIZ # 5

Name	ID	SEC 15	Sr#
------	----	--------	-----

Q1) ( 4 pts) Find the derivative of the function  $f(x) = x \sin^{-1} x + \sqrt{1 - x^2}$ . Write your answer in simplest form.

Q2)(4 pts) Let  $y = \text{Log}_5 \left( \frac{x+4}{x-4} \right)^{\ln 5}$  and  $\frac{dy}{dx} = \frac{a}{16-x^2}$ , then find the value of  $a$ .

Q3) (4 pts) If the curve  $y(x-1)^2 + y^2 = 4$  has a horizontal tangent at the two points  $(a, \pm b)$ , then find  $a + |b|$

Q4) (6 pts) Let  $y = (x + 2 \cos x)^{x+1}$ , then find  $y'(0)$

Q5) (6 pts) Let  $f(x) = x^{49} + \sin(2x)$ . Find  $f^{(49)}(x)$

Q6) (4 pts) A particle moves with a position function  $S(t) = \sin(\pi t) + \cos(\pi t)$ ,  $t \geq 0$ , where  $t$  is measured in seconds and  $S$  in meters. Find the total distance travelled by the particle during the time interval  $0 \leq t \leq 1$ .

Q7) (4 pts) If  $F(x) = g(x)f(g(x))$ , where  $f(3) = 4$ ,  $g(2) = 3$ ,  $f'(3) = 5$ ,  $g'(2) = 10$ , then find  $F'(2)$ .