

King Fahd University of Petroleum & Minerals
Department of Mathematics and Statistics
Math101/Calculus I
Quiz 4
Three Problems, April 17th, 2016 ¹

Problem 1 (6 points)

Find the linear approximations of $f(x)$ at x_0 :

a) $f(x) = \sqrt{x}$; $x_0 = 4$

b) $f(x) = x^3$; $x_0 = 1$

c) $f(x) = \cos(\pi x)$; $x_0 = \frac{1}{2}$

Problem 2 (4 points)

Compute the derivative of $f(x)$:

a) $f(x) = \sinh^{-1}(\sqrt{x^2})$;

b) $f(x) = -\tanh^{-1}(-x)\operatorname{sech}(x^2)$;

Problem 3 (5 points)

Show that the following equation has exactly one root

$$x^3 + e^x = 0$$

¹The quiz lasts 20 minutes.