

Quiz 4, Calculus I

Dr. Adam Graham-Squire, Fall 2017

Name: _____

1. (4 points) The towns of Evatopolis and Ronanville are 200 miles apart, connected by a straight road that runs east to west. Car A leaves from Evatopolis heading toward Ronanville at noon. Also at noon, Car B leaves Ronanville heading directly south. If Car A is driving 40 mph and Car B is driving 65 mph, *use calculus* to find out how fast the (straight line) distance between the two cars is changing at exactly 2pm. Round your answer to the nearest 0.01 mph.

2. (3 points) (a) Calculate the linearization at $p = 0$ for $f(x) = \sin x$.
- (b) Calculate the linearization at $p = 0$ for $f(x) = \tan x$. (Note: you should get the same answer for both (a) and (b)).
- (c) For $x = \frac{\pi}{6}$, does the linearization you calculated give a better approximation for $\sin x$ or for $\tan x$? Explain your reasoning (you will need to use a calculator or a graph to assist your explanation, most likely).

3. (3 points) Find the absolute maximum and minimum for $y = 5e^{x^3-4x}$ on the interval $[-2,2.5]$.