

KEY

Math 125-Quiz 6¹ September 16, 2011

You have ten minutes to complete this quiz. You may use a calculator.

1. (a) What is the difference between a secant line and a tangent line in terms of their graphs?

Secant line \rightarrow crosses @ 2 points

tangent \rightarrow touches @ 1 point

- (b) What is the difference between a secant line and a tangent line in terms of rates of change?

Secant line \rightarrow gives an average rate of change

tangent line \rightarrow gives an instantaneous rate of change

2. Let $f(x) = x - x^2$.

Note that $f(2) = -2$, $f(2.5) = -3.75$, $f(2.1) = -2.31$ and $f(2.01) = -2.0301$

- (a) Find the slope of the secant line between the points $(2, f(2))$ and $(2.5, f(2.5))$

$$\frac{f(2.5) - f(2)}{2.5 - 2} = \frac{-3.75 - (-2)}{.5} = -3.5$$

- (b) Find the slope of the secant line between the points $(2, f(2))$ and $(2.1, f(2.1))$

$$\frac{-2.31 - (-2)}{.1} = -3.1$$

- (c) Find the slope of the secant line between the points $(2, f(2))$ and $(2.01, f(2.01))$

$$\frac{-2.0301 - (-2)}{.01} = -3.01$$

- (d) Estimate the slope of the tangent line to $f(x)$ at $x = 2$.

slope is approaching -3

¹(If you finish early, you may go back and check your work. If you're satisfied with your work, you may turn this sheet over and look at your notes/homework for the remainder of the quiz time. You may not, of course, change any of your answers once you've done so.)