

February 14

What is your favorite part of Valentine's Day?

February 14

Students will verbally explain how to find the slope of the tangent line (using the words: limit, secant, tangent...)

Secant Line

line that crosses the function twice

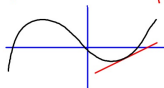


(use 2 points on the function to find the slope)

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{f(b) - f(a)}{b - a}$$

Tangent Line

line that touches the function at one point



# Slope of Secant Line

## Student Activity

Name \_\_\_\_\_

Class \_\_\_\_\_

Open the TI-Nspire document *Slope\_of\_Secant\_Line.tns*.

**Objective:** To use the slope of secant lines to predict the slope of the tangent line to a curve at a given point.

**Directions:** Move the indicated point toward the solid black point on the curve. At each step, press  $\text{2ND} \rightarrow \text{CALC} \rightarrow \text{SLOPE}$  to capture the value of the slope of the secant line. Determine the value of the slope of the tangent line by examining the list of slopes on the subsequent page.

Move to page 2.2.

Press  $\text{2ND} \rightarrow \text{PAGE} \rightarrow 2$  to navigate through the lesson.

- Given function  $f(x) = x^2$ , Step size = 0.5, Point (1, 1) Record your table of slopes and prediction for the slope of the tangent line.

Prediction for Slope of Tangent Line: 2

Slope of Secant Line	
1.5	1.5
2.0	2.0
2.5	2.5
3.0	3.0
3.5	3.5
4.0	4.0
4.5	4.5
5.0	5.0

Move to page 3.1.

- Given function  $f(x) = x^2$ , Step size = 0.2, Point (1, 1) Record your table of slopes and prediction for the slope of the tangent line.

Prediction for Slope of Tangent Line: \_\_\_\_\_

Slope of Secant Line	
1.2	1.2
1.4	1.4
1.6	1.6
1.8	1.8
2.0	2.0
2.2	2.2
2.4	2.4
2.6	2.6
2.8	2.8
3.0	3.0

- Do you feel this prediction is more accurate than your prediction from problem 1? Why or why not?

Move to page 4.1.

- Given function  $f(x) = -x^2 - 5x + 3$ , Step size = 0.05, Point (1, -3) Record your table of slopes and prediction for the slope of the tangent line.

Prediction for Slope of Tangent Line: \_\_\_\_\_

Slope of Secant Line	
-1.05	-1.05
-1.10	-1.10
-1.15	-1.15
-1.20	-1.20
-1.25	-1.25
-1.30	-1.30
-1.35	-1.35
-1.40	-1.40
-1.45	-1.45
-1.50	-1.50