

Title: Find the Equation of  $f'(x)$  Using Slopes

Author: Hannah Lewis

Topics: Slope of a tangent line.

Connection to Core Curriculum: CCSS.MATH.CONTENT.HSF.LE.A.2

Functions -> High School

Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

Overview:

Participants see the visual explanation of how  $f'(x)$  is created using the slope of the tangent line of  $f(x)$ .

Objectives: Participants will

- Graph a function.
- Guess at the slope of the tangent line to find points on  $f'(x)$ .
- Use the applet to see if they were correct in their assumptions.
- Use the applet to find other derivative functions and their relationship to the original function.

Materials: Computer, Pencil

Web References:

Applet: <http://tube.geogebra.org/m/2235103>

Instructions:

1. Use the board to have students guess at the derivative of  $f(x)=\sin(x)$  using the slope of the tangent line

2. Ask students to work in groups of 2 or 3.
3. Pass out the worksheet and direct them to the applet
4. Have students use the applet to determine if their assumptions were correct.
5. Walk around to help individual students with steps. Praise for hard work and effort when applicable.

Background: Participants should understand that the derivative is the slope of the tangent line

Extensions: Participants can use this method to find and understand the relationships between other functions and their derivatives.

Included documents: Task sheet