



About the Mathematics:

The Inverse_Derivative.tns document provides a tool for visualizing the reciprocal relationship between the derivative of a function and the derivative of its inverse.

Math Objectives:

- This activity will allow students to see graphically how the derivative of a function relates to the derivative of an inverse function at a corresponding point on the graph of the inverse.
- Students will reason abstractly and quantitatively. (CCSS Mathematical Practice)
- Students will construct viable arguments and critique the reasoning of others. (CCSS Mathematical Practice)

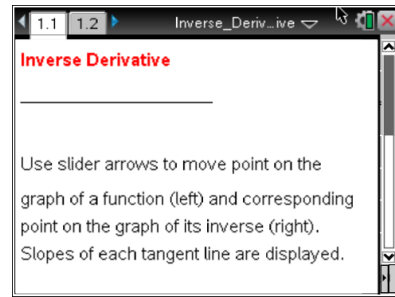
Using the Document:

Page 1.1 provides the instructions. On page 1.2, a slider has been set up to allow students to simultaneously move a point on the graph of a function and the corresponding point on the graph of its inverse. The coordinates of these two points are displayed at the bottom of the screen. In addition, the tangent lines and their slopes m and $\frac{1}{m}$ are displayed at the top of the screen.

Possible Applications

The reciprocal relationship between these two slopes is sometimes confused with the negative reciprocal relationship between a line and a perpendicular line. Questions that clarify this are: If a function is increasing, must its inverse also be increasing? Why? Similarly, if a function is decreasing, must its inverse also be decreasing? Why?

Why does the reciprocal relationship make sense? (Think about the two-point slope formula and the corresponding two points on an inverse's graph where you have switched the roles of x and y .)



TI-Nspire™ Technology Skills:

- Download a TI-Nspire document
- Open a document
- Move between pages
- Click on a minimized slider

Tech Tips:

- Make sure the font size on your TI-Nspire handheld is set to Medium.
- You can hide the function entry line by pressing **ctrl** **G**.

Lesson Materials:

Inverse_Derivative.tns

Visit www.mathnspired.com for lesson updates.