Activity Title "Mean Value Theorem"

Description	Instructor Notes	Slides/Handouts/Files
In this activity students will investigate Rolle's Theorem and investigate and prove the Mean Value Theorem	If desired, functions can be changed. Functions of the type $f(x) = a\begin{Bmatrix}\sin\\ \cos\end{Bmatrix} bx \pm c\begin{Bmatrix}\sin\\ \cos\end{Bmatrix} dx$ work best. Rolle's Theorem is investigated in Problem 1 as a warm-up for the Mean Value Theorem in Problem 2. Be sure to discuss precision needed when approximating zero slopes and equal slopes graphically. Because the calculator is pixilated, it may not provide exact value for the slope that is being examined. In addition to obtaining values by moving a point, it is possible to change the ordered pairs to move a precise location. Note: The questions on the .tns file are duplicated on the worksheet. However, students can submit their .tns file to give you a quick method to assess their performance. Some of the items on the worksheet require students to illustrate their full understanding of the mathematics concepts	MVT Worksheet Mean Value Theorem.tns

Participant Discussion

Worksheet question 1 follow-up:
It is possible to find a function defined algebraically that is continuous on an interval, but not everywhere differentiable?

Ex. $f(x) = 2 + \sqrt{|3x-2|}$

Worksheet question 12 is an application of the MVT.
Students can also use the MVT to prove the 1st derivative test for increasing or decreasing.