4.2 The Mean Value Theorem
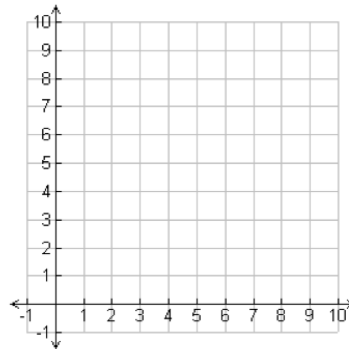
Objectives:

- I know and understand the mean value theorem

- I can find a value that satisfies the mean value theorem

1. Graph $f(x) = x^2$

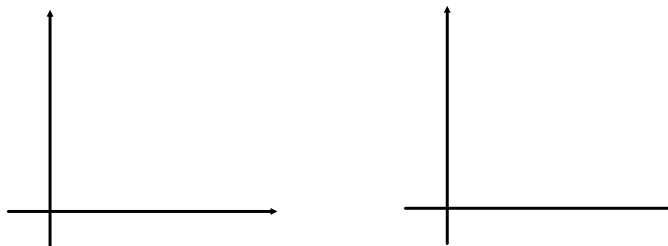2. Graph the secant line over [0,3]

3. Find the slope of the secant line.

4. Is there an x-value on the interval where the derivative is equal to the slope of the secant line?

5. Draw on the graph the point where this occurs and draw the tangent line.

The Mean Value Theorem

Write the MVT in your own words:

What would cause the MVT to fail?

MVT:

Examples:

a) Verify that the mean value theorem applies to each problem.

b) Find c in (a,b) that satisfies the mean value theorem.

1. $f(x) = x^2$, $[-1,2]$

2. $y = e^x$, $[0,2]$

3. $f(x) = \sin x$, $\left[0, \dfrac{\pi}{2} \right]$

4. $y = x^{\frac{2}{3}}, \; [-1,1]$

Pg. 202 #5 $y = \sin^{-1} x, \; [-1,1]$

Pg 202. #9 $y = \dfrac{1}{2x^2},\ [1,3]$