

## 1.1 Preview of Calculus -- Discussion of Limits

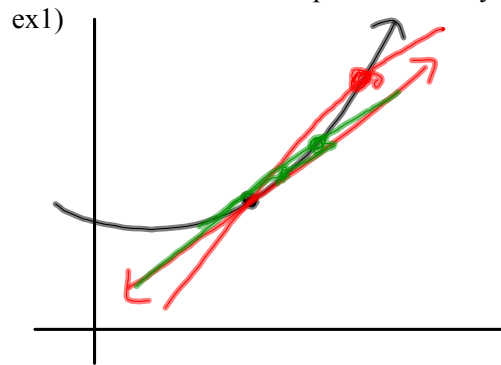
p.40 Swimming Speed  
p.41-43 Preview of Calc

### Tangent Line Problem

Tangent Line -- touches the curve at a single point within a given domain.

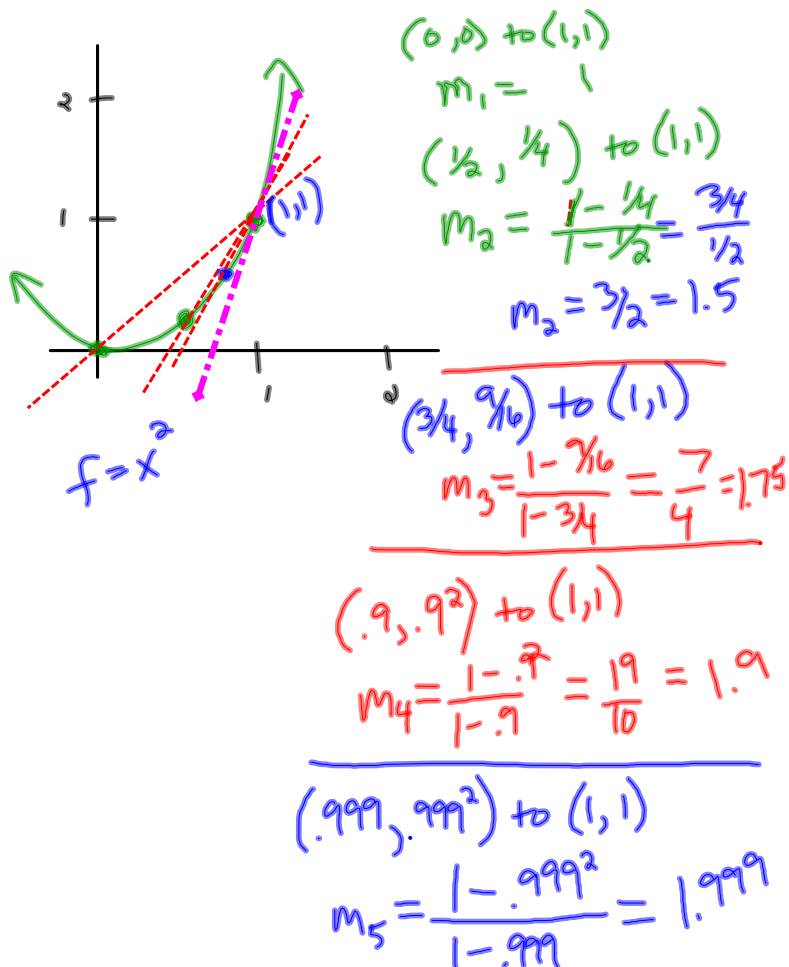
-- to write the eqn. of the tangent line, you must find the slope.

-- on a curve the slope is constantly changing.



ex2) Approximate the slope of  $f(x) = x^2$  at point  $(1,1)$ .

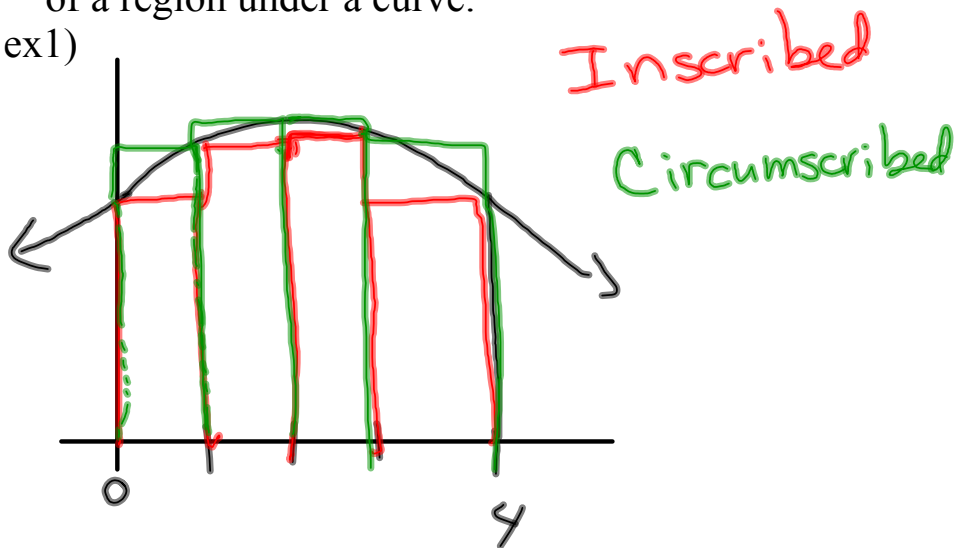
-- find the slope of several secant lines that get closer and closer to the tangent line at  $(1,1)$



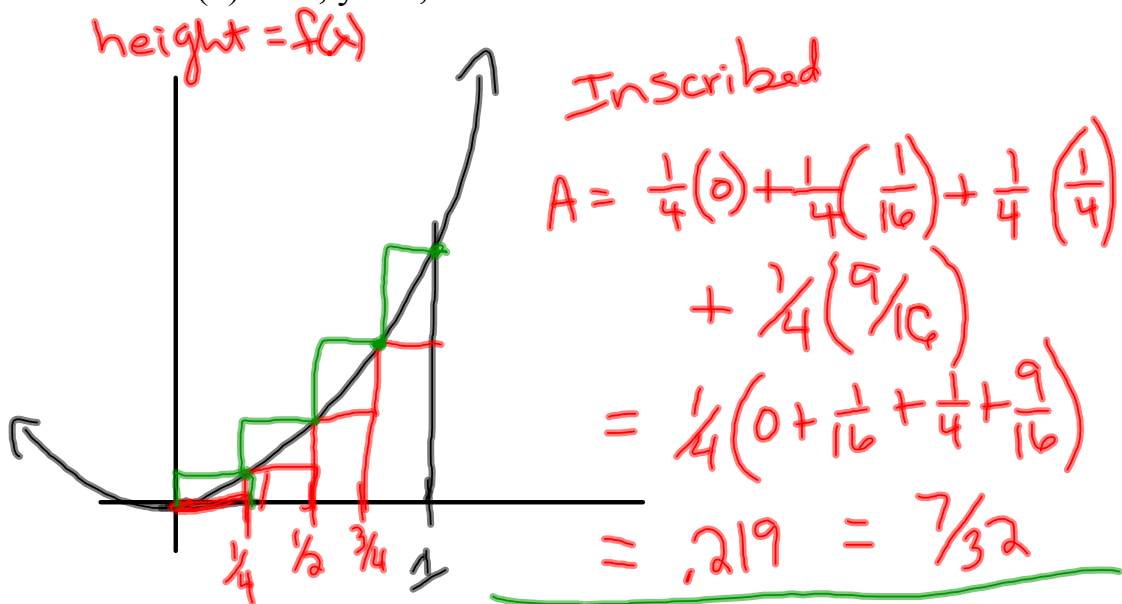
## Area Problem

-- use several rectangles to approximate the area of a region under a curve.

ex1)



ex2) Approximate the area of the region bounded by  $f(x) = x^2$ ,  $y = 0$ , and  $x = 1$ .



Circ:

$$A = \frac{1}{4}\left(\frac{1}{16} + \frac{1}{4} + \frac{9}{16} + 1\right) = \frac{15}{32} \approx .469$$

$$\text{Approx. Area} = \frac{.219 + .469}{2}$$

$$\approx .344$$

HW: p46 #1-8,10,11

Rate of Change = Slope