

## **Informal Definition of Derivative**

If the graph of a function has a unique tangent line at a point (regardless of direction), then the function is said to be differentiable at that point. Furthermore, the slope of the tangent line at that point is called the derivative at the point.

## **Differentiability implies continuity**

If  $f$  is differentiable at  $x = c$ , then  $f$  is continuous at  $x = c$ .

## **Increasing/decreasing functions**

If  $f$  is differentiable at each point of  $(a, b)$  and the derivative is positive at each point, then  $f$  is increasing on  $(a, b)$ .

If  $f$  is differentiable at each point of  $(a, b)$  and the derivative is negative at each point, then  $f$  is decreasing on  $(a, b)$ .