

Limits and Motion

5-28-08

Derivative at a Point

The derivative of the function f at $x = a$,

$$f'(a) = \lim_{h \rightarrow 0}$$

Derivative

If $y = f(x)$, then the derivative of the function with respect to x , is the

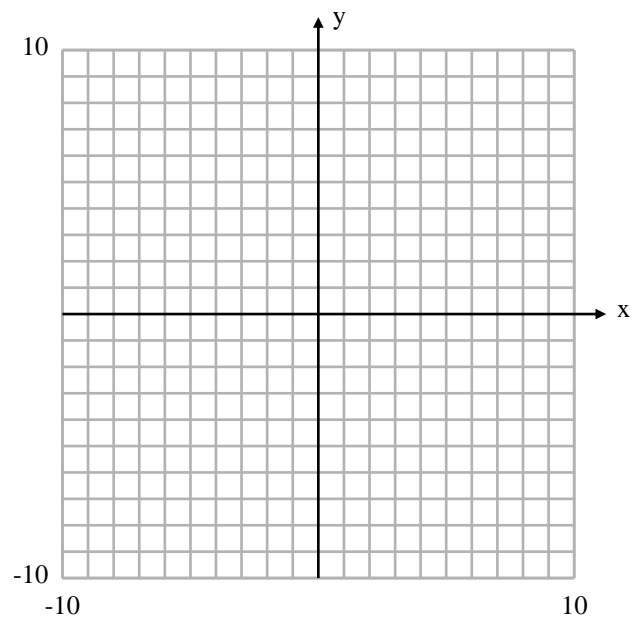
$$f'(x) = \lim_{h \rightarrow 0}$$

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1. Use the limit definition to find
 - a. the slope of the graph of the function at the indicated point
 - b. an equation of the tangent line at the point.
 - c. Sketch a graph of the curve near the point without using your graphing calculator.

$$f(x) = 2x^2 - 7x + 3 \quad \text{at } x = 5$$



2. Find the derivative, if it exists, of the function at the specific point.

$$f(x) = 2x + \frac{1}{2}x^2 \quad \text{at } x = 2$$

3. Find the derivative of f .

$$f(x) = \frac{1}{x-2}$$