**Calculus Section 2.1 Definition of a Derivative**

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#’s 13, 25, 28, 39, 42, 45

-Find the slope of the tangent line to a curve at a point.
-Use the limit definition to find the derivative of a function.

 **Definition of the Derivative of a Function**The derivative of a function allows you to find the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at a point.
The derivative of *f* is given by:

Provided the limit exists. For all x for which this limit exists, f ’ is a function of x.

**Different ways to write the derivative:**

1) 2) 3) 4) 5)

**Finding the derivative of a function using limits:**

Find the derivative of f(x) = 2x – 3 (The answer should be 2 because it is the slope of y = mx + b)

Find the derivative of f(x) = . Find the equation of the tangent line through the point (2, 12).

**Alternate Definition of a Derivative**An alternative definition of a derivative is written:

 

This definition is based on the formula for \_\_\_\_\_\_\_\_\_\_. The derivative is the calculated slope between two points that are infinitesimally close together.

The existence of this alternative form requires that the one-sided limits

  and 

exist and are equal. Otherwise, the function has no derivative at point c.