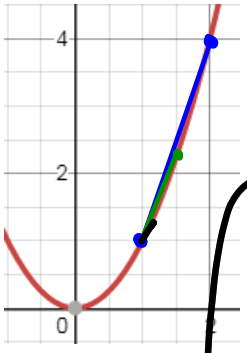
Let $y = x^2$

Find the slope b/w

1) $(1,1)$ & $(2,4)$ $m = 3$

2) $(1,1)$ & $(1.5, y(1.5))$ $m = 2.5$

3) $(1,1)$ & $(1.1, y(1.1))$ $m = 2.1$



$$\lim_{x \to 1} \frac{f(x) - f(1)}{x - 1}$$

slope of $y = f(x)$ about $x = 1$

slope $\frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$ $(1, f(1))$ $(x, f(x))$

$$\lim_{x \to 1} \frac{x^2 - 1}{x - 1} = \lim_{x \to 1} \frac{(x+1)(x-1)}{x-1}$$

$$= 2$$

the slope of a tangent line for y = x^2 about (at) x = 1 is 2.

Let $y = x^2$

Find the slope of the tangent line at $x=3$

$$\lim_{x \to 3} \frac{x^2 - 9}{x - 3} = \lim_{x \to 3} \frac{(x-3)(x+3)}{x-3} = 6$$

$(x, f(x))$

$(x+h, f(x+h))$

$$\lim_{h \to 0} \frac{f(x+h) - f(x)}{x+h-x}$$

slope at $x = x$

derivative of $y = f(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$

$$\frac{df}{dx}$$

$$f'$$

what is the slope of $y = x^2$?

$x^2 + 2xh + h^2$

$$y' = \frac{dy}{dx} = \lim_{h \to 0} \frac{(x+h)^2 - x^2}{h} = \lim_{h \to 0} \frac{2xh + h^2}{h}$$

$$= \lim_{h \to 0} 2x + h = 2x$$

$y = x^2$

$y' = 2x$

Slope at $x = 1$

$y'(1) = 2(1) = 2$

Slope at $x = 3$

$y' = 2(3) = 6$

27. $f(t) = \dfrac{2t + 1}{t + 3}$

$f'(a)$

$$\lim_{h \to 0} \frac{f(t+h) - f(t)}{h}$$