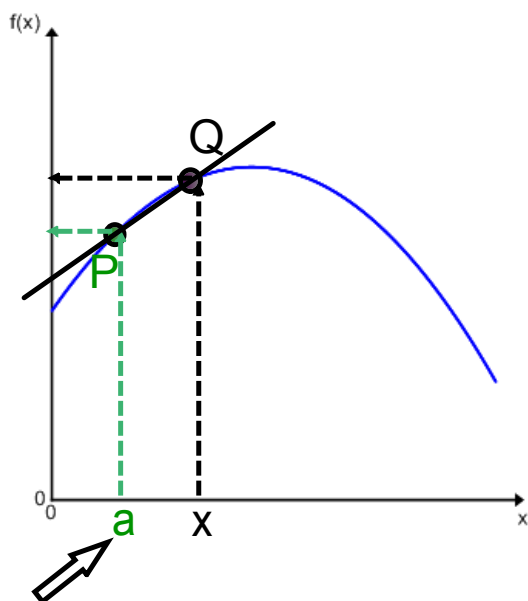


MHF 4UI UNIT 3 RATES OF CHANGE

Day 3 - Using Limits to Find Tangents

To find the slope of a tangent:



$$m_{pq} = \frac{\Delta y}{\Delta x}$$

$$= \underline{\hspace{2cm}}$$

Point where the tangent occurs!!

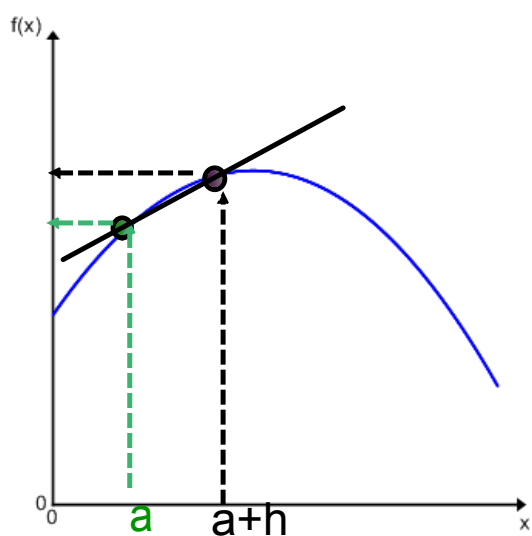
As we move Q close to P, then

$x \rightarrow a$ and the distance between x and a gets very close to zero!

$$m_{tangent} = \lim_{x \rightarrow a} \frac{f(x) - f(a)}{x - a} \quad \text{Formula \# 1}$$

Example 1: Find the slope of the tangent to the curve
 $y = x^2 + 3x + 4$ at $x = -2$

$$m_{\text{tangent}} = \lim_{x \rightarrow a} \frac{f(x) - f(a)}{x - a}$$



$$m_{pq} = \frac{\Delta y}{\Delta x}$$

$$= \underline{\hspace{2cm}}$$

Point where the tangent occurs!!

$$m_{\text{tangent}} = \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h} \quad \text{Formula \# 2}$$

Example 2: Find the slope of the tangent to the curve
 $y = x^2 + 3x + 4$ at $x = -2$ (this time use Formula 2)

$$m_{\text{tangent}} = \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$$

Example 3: Find the slope of the tangent to the curve
 $y = 5x^2 - 8x$, when $x = 3$