
Slope of the Secant Line

To find the slope of the secant line, we use the formula

$$m_{sec} = \frac{f(x + \Delta x) - f(x)}{\Delta x} \quad (1)$$

You need to know this formula. The x represents the starting point of your interval. The Δx is the distance from x to the end of your interval.

Example 1 Identify the x and Δx for the interval $[2, 10]$

Solution 1 x is the start of the interval, so $x = 2$. Δx is the distance to the end of the interval, so $\Delta x = 10 - 2 = 8$.

Example 2 Identify the x and Δx for the interval $[-3, 7]$

Solution 2 x is the start of the interval, so $x = -3$. Δx is the distance to the end of the interval, so $\Delta x = 7 - (-3) = 10$.

Example 3 Find the slope of the secant line of $f(x) = 2x - 3$ for the interval $[2, 10]$

Solution 3 x is the start of the interval, so $x = 2$. Δx is the distance to the end of the interval, so $\Delta x = 10 - 2 = 8$. Now we plug into formula (1).

$$\begin{aligned} m_{sec} &= \frac{f(x + \Delta x) - f(x)}{\Delta x} \\ &= \frac{f(10) - f(2)}{8} \\ &= \frac{[2(10) - 3] - [2(2) - 3]}{8} \\ &= \frac{17 - 1}{8} \\ &= \frac{16}{8} \\ &= 2 \end{aligned}$$