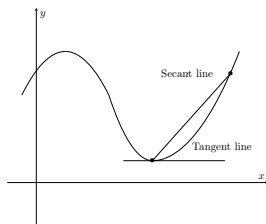


## DIFFERENCE QUOTIENT AS AN AVERAGE RATE OF CHANGE:

This is the difference quotient:

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



E.g. Find the difference quotient of  $y = 2x + 5$

1.  $f(x+h) = 2x + 2h + 5$

2.  $f(x) = 2x + 5$

3.  $\frac{f(x+h) - f(x)}{h} = \frac{2h}{h} = 2$

The difference quotient provides a formula to find the **average local gradient** at any given point.

### 6.5 WORKED EXAMPLE

Find the difference quotient of the function

$$y = 3x^3 + x^2 + 2x + 4.$$