Example 1

Consider $f(x) = x^2 + 7x + 10$. Determine the average gradient between the points x=2 and x=-1

Answer

1. **First work out the y value at x=2 and x=-1**
   LET x_1=2 and x_2=-1

$f(2) = (2)^2 + 7(2) + 10.$
$f(2) = 4 + 14 + 10$
$f(2) = 28 = y_1$

$f(-1) = (-1)^2 + 7(-1) + 10$
$f(-1) = 1 - 7 + 10$
$f(-1) = 4 = y_2$

2. **Use the gradient formula**

$m = \frac{y_2 - y_1}{x_2 - x_1}$
$m = \frac{4-28}{-1-2}$
$m = \frac{-24}{-3} = 8$

The average gradient between x=2 and x=-1 for f(x) is 8.

Example 2 (Try yourself)

Determine the average gradient of the graph of $y = 5x^2 - 4$ between:

a) $x = 1$ and $x = 3$

b) $x = 2$ and $x = 3$

Example 3 (Try yourself)

Determine the average gradient of the graph of $g(x) = \frac{4}{x-3} - 1$ between:

a) $x = -1$ and $x = 0$