Gr 12

Average Gradient Example

Example 3

Give that: $f(x) = x^3 - 2x^2 - 7x - 4$

Determine the average gradient between $x = 0$ and $x = -1,5$

Answer

$$f(0) = -4$$

$$f(-1,5) = -1,375$$

$$\text{Average gradient} = \frac{f(-1,5) - f(0)}{-1,5 - 0} \checkmark\checkmark$$

$$= -1,75 \checkmark$$

Example 4

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 $x_2=-1$

$f(2) = (2)^2 + 7(2) + 10.$

$f(2) = 4 + 14 + 10$

$f(2) = 28 = y1$

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

$f(-1) = 1 - 7 + 10$

$f(-1) = 4 = y2$

2. Use the gradient formula

$m = y2 - y1 / x2 - x1$

$m = 4 - 28 / -1 - 2$

$m = -24 - 3 = 8$

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