

Differentiation can tell us how a function is changing.

In economics, we can see how marginal costs varies with the quantity of a product produced.

At point A, the function is less than zero and is decreasing.

At point B the function is more than zero and is increasing.

At point C the function is zero and is stationary.

A function, f , is defined on the set of real numbers by $f(x) = x^3 - 7x + 6$, is it decreasing or increasing when $x = 2$?

First, differentiate the function with respect to x .

$f'(x) = 3x^2 - 7$.

Next, substitute $x = 2$ into the derivative.

So, $f'(2) = 3 \times 2^2 - 7$, which is twelve subtract seven, to get a value of five.

As the value is positive, the derivative is greater than zero, so the function is increasing when $x = 2$.

Problems involving increasing and decreasing functions can be solved by differentiation.

If $f'(x) > 0$, the graph is increasing.

If $f'(x) < 0$, the graph is decreasing.

If $f'(x) = 0$, the graph is stationary at a maximum or minimum.