



Differentiation (Increasing and Decreasing Functions)

Revise this topic →



← Check your work

This booklet features original exam style questions designed by me. They do not feature in past papers but are good practice for your exams.

The content is designed to reflect the style of the **AQA Level 2 Certificate in Further Maths**.
It may not be suitable for other courses.





Answer **all** questions in the spaces provided.

1 Work out the values of x for which $f(x) = 3x^2 - 4x$ is a decreasing function.

Give your answer as an inequality.

[3 marks]

Answer _____

2 Work out the values of x for which $f(x) = \frac{1}{3}x^3 + 2x^2 - 12x$ is a decreasing function.

Give your answer as an inequality.

[5 marks]

Answer _____



Do not write
outside the
box

3 Work out the values of x for which $f(x) = 10x - x^2$ is an increasing function.

Give your answer as an inequality.

[3 marks]

Answer _____

4 Work out the values of x for which $f(x) = x^3 + 4x^2 - 3x$ is an increasing function.

Give your answer as an inequality.

[5 marks]

Answer _____

Turn over ►





5 $f(x) = \frac{1}{3}x^3 - 3x^2 + 11x$

Use differentiation to show that $f(x)$ is an increasing function for all values of x .

[3 marks]

6 $f(x) = 3x^2 - 10x - \frac{1}{3}x^3$

Use differentiation to show that $f(x)$ is an decreasing function for all values of x .

[3 marks]





7 $f(x) = x^3 + 3x^2 + 7x$

Use differentiation to show that $f(x)$ is an increasing function for all values of x .

[4 marks]

8 $f(x) = -3x^3 + 18x^2 - 38x$

Use differentiation to show that $f(x)$ is an decreasing function for all values of x .

[4 marks]

