

## 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.



Do not write
outside the
hox

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

Work out the values of x for which $f(x) = 10x - x^2$	is an increasing function.
Give your answer as an inequality.	[3 mark
Answer	
Answer Work out the values of $x$ for which $f(x) = x^3 + 4x^2 - 4x^2$ Give your answer as an inequality.	
Work out the values of $x$ for which $f(x) = x^3 + 4x^2 - 4x^2 -$	3x is an increasing function
Work out the values of $x$ for which $f(x) = x^3 + 4x^2 - 4x^2 -$	3x is an increasing function
Work out the values of $x$ for which $f(x) = x^3 + 4x^2 - 4x^2 -$	3x is an increasing function
Work out the values of $x$ for which $f(x) = x^3 + 4x^2 - 4x^2 + 4x^2 - 4x^2 + 4x^2 +$	3x is an increasing function

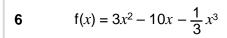
Turn over ▶



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]



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

[3 marks]



Do not write outside the box

7 $f(x) = x^3 + 3x$	<sup>2</sup> +	7 <i>x</i>
---------------------	----------------	------------

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]