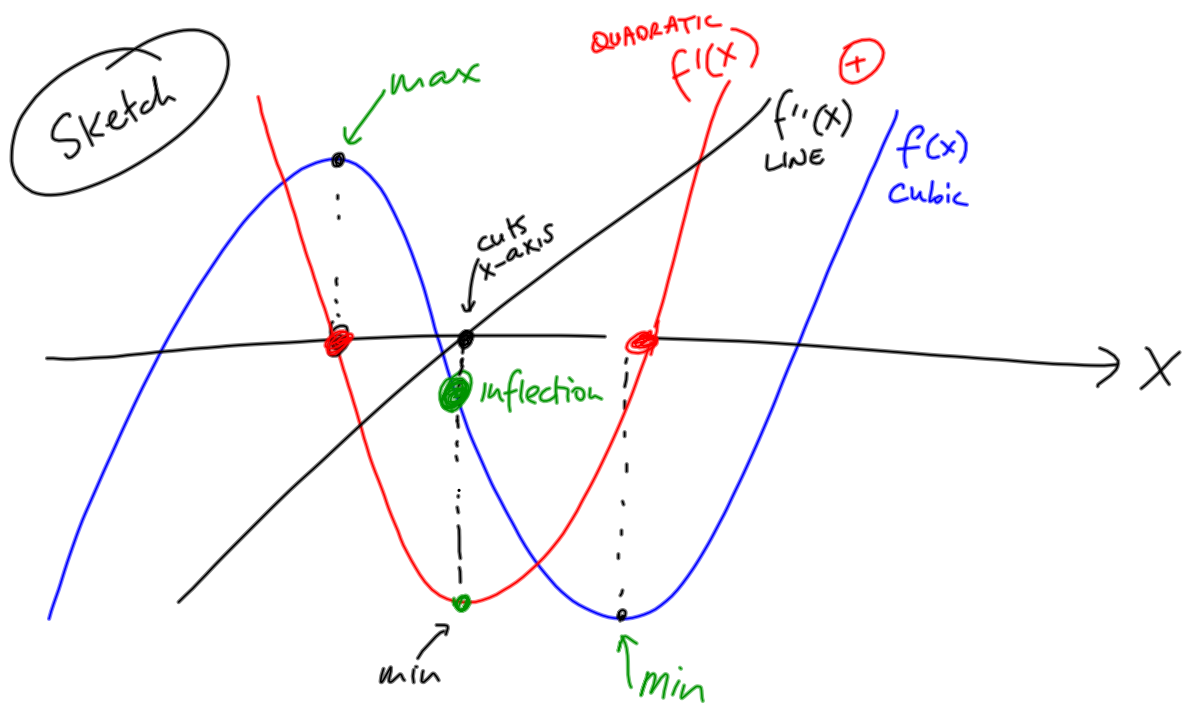


chapter **3** Applications of Differential Calculus

Section 3.3 Graphs of the derived (or slope) function

PROJECT MATHS  
Text & Tests **7**

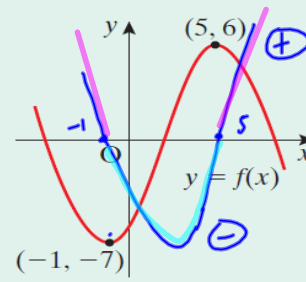
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**Example 1**

The graph of the function  $y = f(x)$  is shown. Use the graph to write down the range of values of  $x$  for which

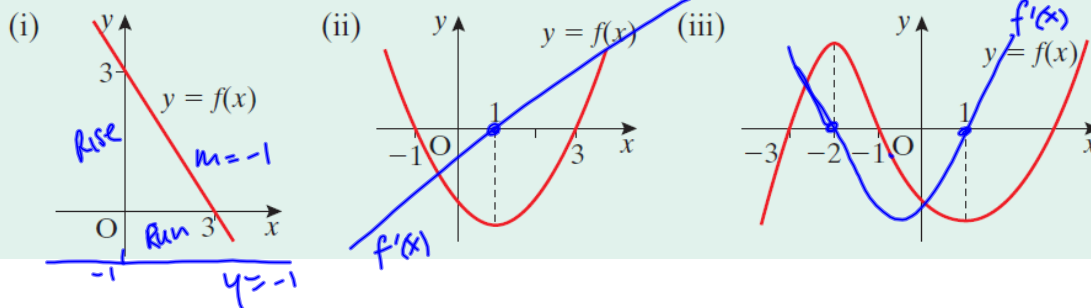
- (i)  $f'(x) > 0$       (ii)  $f'(x) < 0$       (iii)  $f'(x) = 0$ .



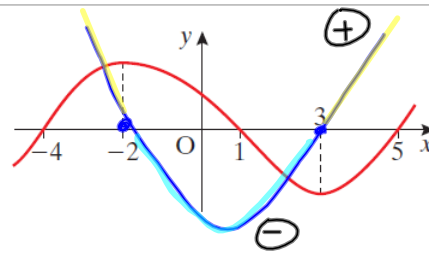
- (i)  $f'(x) > 0$        $-1 > x > 5$  (outside)
- (ii)  $f'(x) < 0$        $-1 < x < 5$  (inside)
- (iii)  $f'(x) = 0$        $x = -1, x = 5$

**Example 2**

Draw a rough sketch of  $y = f'(x)$  for each of the following graphed functions.



3. The graph of the function  $y = f(x)$  is shown on the right.



- (i) Explain what is meant by ' $f'(x) > 0$ '?
- (ii) For what range of values of  $x$  is  $f'(x) > 0$ ?
- (iii) For what range of values of  $x$  is  $f'(x) < 0$ ?
- (iv) For what values of  $x$  is  $f'(x) = 0$ ?

- (i)  $f'(x) > 0$       slope function is positive  
curve is increasing
- (ii)  $f'(x) > 0$       (outside)       $-2 > x > 3$
- (iii)  $f'(x) < 0$       (inside)       $-2 < x < 3$
- (iv)  $f'(x) = 0$       (turning points)       $x = -2, x = 3$

8. Draw a rough sketch of the graph of  $y = f'(x)$  for each of the following:

