

Name: _____

Level 2 Further Maths

Stationary Points



Corbettmaths

Ensure you have: Pencil or pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Revision for this topic

www.corbettmaths.com/more/further-maths/



1. A curve has equation $y = x^2 - 4x + 21$

(a) Find $\frac{dy}{dx}$

.....
(2)

(b) Hence, find the coordinates of the minimum point.

.....
(3)

2. A curve has equation $y = 1 + x - x^2$

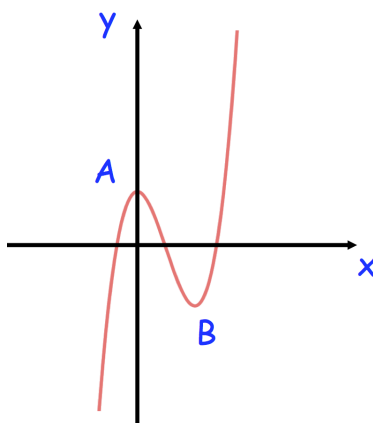
(a) Find $\frac{dy}{dx}$

.....
(2)

(b) Hence, find the coordinates of the maximum point.

.....
(3)

3. A curve has equation $y = x^3 - 3x^2 + 1$



Work out the coordinates of the stationary points, A and B.

A =

B =

(5)

4. $y = 2x^3 - 9x^2 + 12x - 9$

(a) Work out $\frac{dy}{dx}$

.....
(3)

(b) Hence, work out the coordinates of the stationary points of

$$y = 2x^3 - 9x^2 + 12x - 9$$

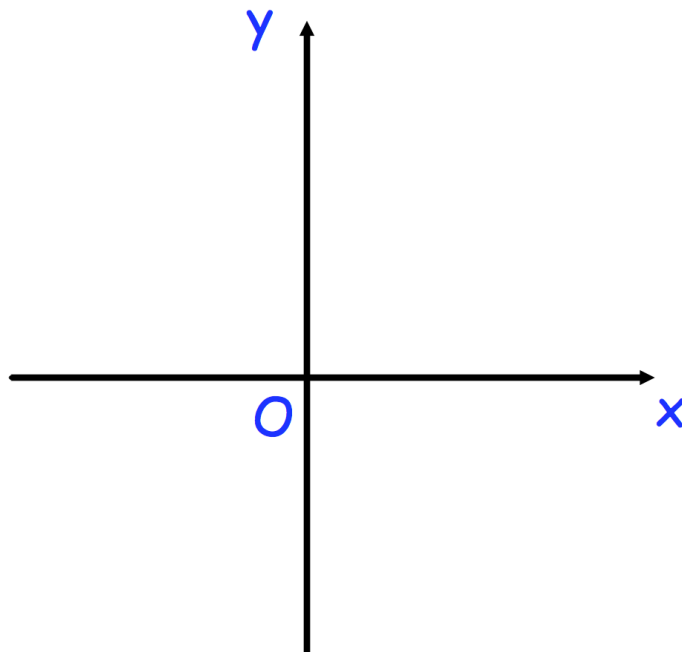
..... and

(3)

5. (a) Work out the stationary points on the curve $y = x^3 - 3x$

..... and
(4)

(b) Sketch $y = x^3 - 3x$



(3)

6. The curve C has equation $y = 3x^4 - 12x^3 + 2$

(a) Find $\frac{dy}{dx}$

.....
(2)

(b) Find $\frac{d^2y}{dx^2}$

.....
(1)

(c) Show that C has a stationary point when $x = 3$

(2)

(d) Determine the nature of this stationary point, giving a reason for your answer

(2)

7. The curve C has equation $y = -x^3 + 12x^2 - 36x$

Work out the coordinates of any stationary point on this curve and determine their nature

(6)

8. The equation of a curve is $y = x^3 - \frac{1}{2}x^2 + ax + 1$ where a is a constant

The curve has a maximum point at $\left(-\frac{2}{3}, \frac{49}{27}\right)$

The curve has a minimum point at $(1, -0.5)$

Work out the value of a

.....
(6)

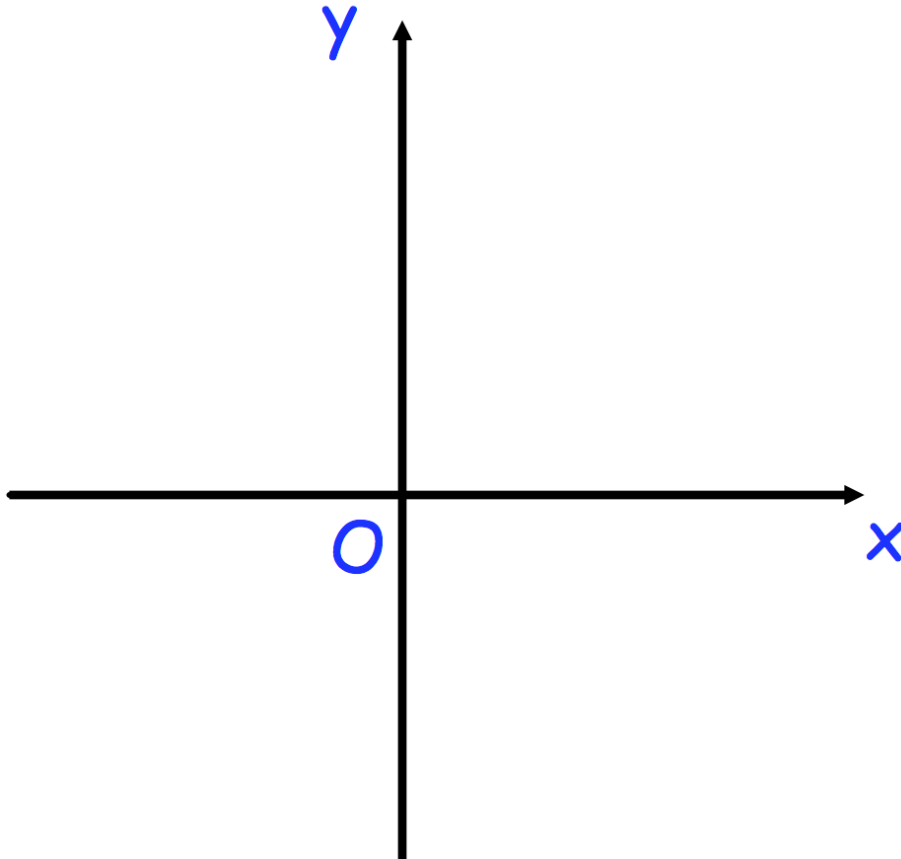
9. $y = f(x)$ has exactly two stationary points.

The stationary points are

a minimum at $D(3, -2)$

a maximum at $E(b, c)$ where $0 < b < 3$ and $-2 < c < 0$

Sketch the curve and label D and E.



(3)