

Name:

Level 2 Further Maths



Equation of a Normal

Corbettmaths

Ensure you have: Pencil or pen

Guidance

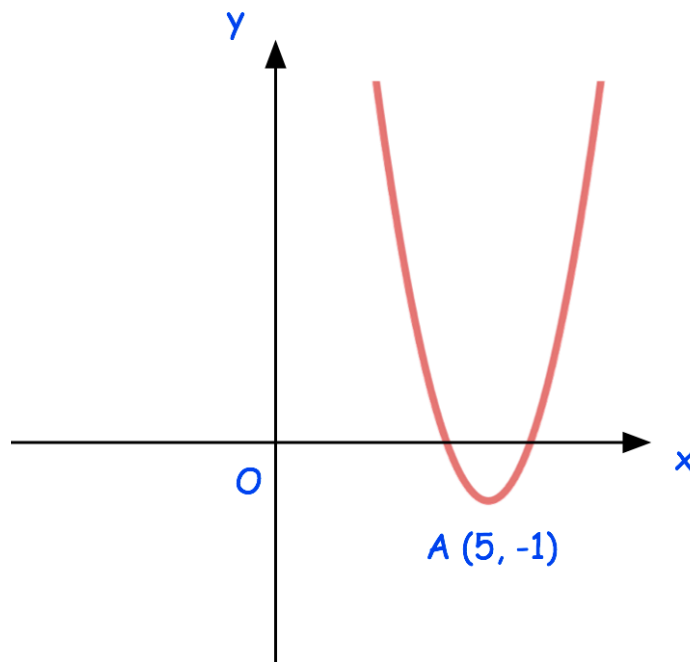
1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Revision for this topic

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



1. Below is a sketch of $y = f(x)$



There is a minimum point at A $(5, -1)$

(a) Write down the equation of the tangent at the point A

.....
(1)

(a) Write down the equation of the normal at the point A

.....
(1)

2. A curve has equation $y = x^2 + 8x$

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

.....
(2)

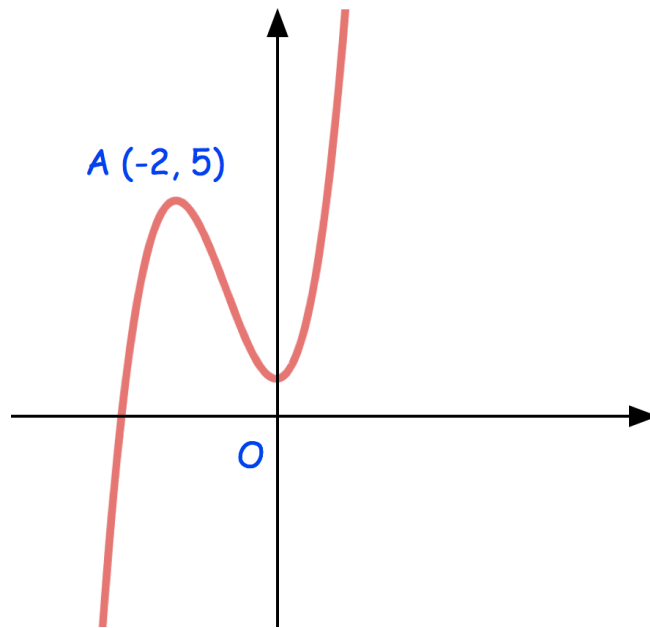
(b) Find the gradient of the curve at the point (1, 9)

.....
(2)

(c) Find the gradient of the normal to the curve at the point (1, 9)

.....
(1)

3. Here is a sketch of $y = f(x)$



There is a maximum point at A $(-2, 5)$

(a) Write down the equation of the normal to the curve at A

.....
(1)

Given $\frac{dy}{dx} = 3x^2 + 6x$

(b) Work out the equation of the normal to the curve at the point at $(-1, 3)$

.....
(5)

4. Work out the equation of the normal to the curve $y = 2x^2 - 4x + 1$ at the point $(2, 1)$

Give your answer in the form $y = mx + c$

.....
(5)

5. Work out the equation of the normal to the curve $y = x^3 - 2x + 1$ at the point where $x = -1$

.....
(5)

6. Work out the equation of the normal to the curve $y = 2x^3 + x^2 - 7x - 5$ at the point $(0, -5)$

Give your answer in the form $y = mx + c$

.....
(5)

7. Work out the equation of the normal to the curve $y = (x + 2)(x + 3)$ at the point where $x = -4$

.....
(5)

8. The point A lies on the curve $y = x^2 - 2x + 4$

The x-coordinate of A is -1

The normal at A also intersects the curve at B.

Work out the coordinates of point B.

.....
(8)

9. A curve has equation $y = 4x^2 + 2x - 3$

A normal to the curve is drawn at the point A.

The normal is parallel to the line with equation $x - 6y = 2$

Find the equation of the normal at the point A.

Give your answer in the form $y = mx + c$

.....
(6)