

C4 Normal And Tangents Questions

2005

3. Find the equation of the tangent to the curve

$$4x^2 + 3xy - y^2 = 21$$

at the point (2, 1).

[4]

2006

2. Find the equation of the normal to the curve

$$2x^3 + 6xy^2 - y^4 = 27$$

at the point (2, 1).

[5]

2007

2. Find the equation of the tangent to the curve

$$x^5 + xy^2 + y^3 = 17$$

at the point (-1, 3).

[4]

2008

2. Find the equation of the normal to the curve

$$x^2 + xy + 2y^2 = 8$$

at the point (-3, 1).

[5]

2010

2. Find the equation of the normal to the curve

$$5x^2 + 4xy - y^3 = 5$$

at the point (1, -2).

[5]

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2011

2. Find the equation of the normal to the curve

$$x^4 - 2x^2y + y^2 = 4$$

at the point (1, 3).

[5]

2012

2. Find the equation of the tangent to the curve

$$y^3 - 4x^2 - 3xy + 25 = 0$$

at the point (2, -3).

[4]

2013

2. Find the equation of the normal to the curve

$$x^3 - 2xy^2 + y^3 = 5$$

at the point (2, 1).

[5]

2014

1. The curve C is defined by

$$3x^3 - 5xy^2 + 2y^4 = 15.$$

The point P has coordinates (1, 2) and lies on C .
Find the equation of the **normal** to C at P .

[5]

2015

2. The curve C has equation

$$x^4 + 3x^2y - 2y^2 = 34.$$

(a) Show that $\frac{dy}{dx} = \frac{4x^3 + 6xy}{4y - 3x^2}$.

[3]

- (b) Find the coordinates of each of the points on C where the tangent is parallel to the y -axis.

[4]

2016

3. The curve C has equation

$$x^4 + 2x^3y - 3y^4 = 16.$$

(a) Show that $\frac{dy}{dx} = \frac{2x^3 + 3x^2y}{6y^3 - x^3}$. [3]

(b) Show that there are only two points on C where the gradient of the tangent is -2 .
Find the coordinates of each of these two points. [4]

2017

2. The curve C has equation

$$y^6 - 3x^4 - 9x^2y + 48 = 0.$$

(a) Show that $\frac{dy}{dx} = \frac{6xy + 4x^3}{2y^5 - 3x^2}$. [3]

(b) Find the gradient of the tangent to C at each of the points where C crosses the x -axis. [3]