Name:

Level 2 Further Maths

Gradient of a Curve

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 gradient function $\frac{dy}{dx} = 4x^2 + 1$

Work out the gradient of the curve when $x = 3$

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(2)

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2. A curve has gradient function $\frac{dy}{dx} = 15 - x^3$

Work out the gradient of the curve when $x = -3$

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(2)

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3. A curve has gradient function $\frac{dy}{dx} = 7x^2 - 3$

Work out the values of *x* for which the rate of change of *y* with respect to *x* is 25

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(2)

4. A curve has gradient function $\frac{dy}{dx} = 5x - x^2$

(a) Work out the gradient of the curve when $x = 9$

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(2)

(b) Work out the values of x for which the rate of change of y with respect to x is 1

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(2)

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5. $y = 2x^3 + 4x^2 - 7x$

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

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(2)

(b) Work out the gradient of $y = 2x^3 + 4x^2 - 7x$ at the point $(1, -1)$

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(2)

6. Work out the gradient of the curve $y = 3x^2 - 4x + 7$ at the point $(-2, 27)$

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(3)

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7. Work out the gradient of the curve $y = (x - 2)(3x + 1)$ at the point when $x = 3$

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(3)

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8. Work out the gradient of the curve $y = x^3(8 - x)$ at the point on the curve where $x = -1$

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(3)

9. $y = \frac{3}{5}x^5 - 3x^3$

Work out the rate of change of y with respect to x when x = –1

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(3)

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10. $y = \frac{2x^6 - x^5}{x^3}$

Work out the rate of change of y with respect to x when x = 3

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(3)

11. Work out the gradient of the curve $y = (x - 2)(x + 1)^2$ at the point (2, 0)

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(4)

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

The gradient of the curve at point P is 9

Work out the coordinates of the point P.

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(4)

13. A curve has equation $y = (x + 2)(x - 3)$

The gradient of the curve at point P is –4

Work out the coordinates of the point P.

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(4)

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14. A curve has equation $y = \frac{2}{3}x^3$

The gradient of the curve at the points P and Q are equal to 18

Work out the coordinates of the points P and Q.

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(6)

15. A curve has the equation $y = x^2 + ax + 4$ where a is a constant.

The gradient of the curve when x = 2 is twice the gradient of the curve when x = –1

Work out the value of *a*

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(4)

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16. A curve has the equation $y = x^3 + ax^2 - 8$ where a is a constant.

The gradient of the curve when x = 2 is eleven times the gradient of the curve when x = –2

Work out the value of *a*

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(5)