

AQA – Differentiation – AS Mathematics P1

1. June/2021/Paper_7356/1/No.2

Given that $\frac{dy}{dx} = \frac{1}{x}$ find $\frac{d^2y}{dx^2}$

Circle your answer.

[1 mark]

$$-\frac{2}{x^2}$$

$$-\frac{1}{x^2}$$

$$\frac{1}{x^2}$$

$$\frac{2}{x^2}$$

2. June/2021/Paper_7356/1/No.6

A curve has the equation $y = e^{-2x}$

At point P on the curve the tangent is parallel to the line $x + 8y = 5$

Find the coordinates of P stating your answer in the form $(\ln p, q)$, where p and q are rational.

[7 marks]

3. June/2021/Paper_7356/1/No.9

A curve has equation

$$y = \frac{a}{\sqrt{x}} + bx^2 + \frac{c}{x^3} \quad \text{for } x > 0$$

where a , b and c are positive constants.

The curve has a single turning point.

Use the second derivative of y to determine the nature of this turning point.

You do not need to find the coordinates of the turning point.

Fully justify your answer.

[7 marks]