adamjee maths

A-LEVEL MATHS / EDEXCEL / FREE RESOURCES

Differentiation from first principles

Question paper

3 questions

Exam questions and marking instructions remain credited to their board.

Contents

1 June 2024 - Paper 1 - Q4

2 June 2023 - Paper 1 - Q12

3 June 2022 - Paper 2 - Q4

4. Given that $y = x^2$, use differentiation from first principles to show that $\frac{dy}{dx} = 2x$

(3)

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Question 4 continued

(Total for Question 4 is 3 marks)

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12. $y = \sin x$

where x is measured in radians.

Use differentiation from first principles to show that

$$\frac{\mathrm{d}y}{\mathrm{d}x} = \cos x$$

You may

- use without proof the formula for $\sin(A \pm B)$
- assume that as $h \to 0$, $\dfrac{\sin h}{h} \to 1$ and $\dfrac{\cos h - 1}{h} \to 0$

(5)

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Question 12 continued

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4. Given that

$$y = 2x^2$$

use differentiation from first principles to show that

$$\frac{dy}{dx} = 4x$$

(3)

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Question 4 continued

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