

QQQ – Core Pure 2 – Chapter 2 – More Series (Version 2)

Total Marks: 23

(23 = Platinum, 21 = Gold, 18 = Silver, 16 = Bronze)

1. Find the first two non-zero terms of the Maclaurin series expansion of $\cos(2x)$

Tick (✓) **one** box.

[1 mark]

- $1 - x^2$
- $1 - 2x^2$
- $2 - x^2$
- $2 - 2x^2$

(Total 1 marks)

AQA AS June 2025 Paper 1 Q4

2. The first two non-zero terms of the Maclaurin series expansion of $f(x)$ are x and $-\frac{1}{2}x^3$

Which one of the following could be $f(x)$?

Circle your answer.

[1 mark]

- $xe^{\frac{1}{2}x^2}$
- $\frac{1}{2}\sin 2x$
- $x\cos x$
- $(1 + x^3)^{-\frac{1}{2}}$

(Total 1 marks)

AQA A2 June 2019 Paper 1 Q2

3. In this question you may use results from the formulae booklet without proof.

Use the binomial series for $(1 + x)^n$ and the Maclaurin's series for $\sin x$ to find the series

expansion for $\frac{1}{(1 + \sin \theta)^4}$ up to and including the term in θ^3

[4 marks]

(Total 4 marks)

AQA A2 June 2024 Paper 2 Q18

4. Use the method of differences to prove that for $n > 2$

$$\sum_{r=2}^n \frac{4}{r^2 - 1} = \frac{(pn + q)(n - 1)}{n(n + 1)}$$

where p and q are constants to be determined.

(5)

(Total 5 marks)

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5. Using the Maclaurin series for $\cos 2x$, show that, for small values of x ,

$$\sin^2 x \approx ax^2 + bx^4 + cx^6,$$

where the values of a , b and c are to be given in exact form.

[5]

(Total 5 marks)

OCR MEI A2 June 2019 Paper 1 Q5

6.

(a) Use differentiation to find the first two non-zero terms of the Maclaurin expansion of

$$\ln \left(\frac{1}{2} + \cos x \right).$$

[4]

(b) By considering the root of the equation $\ln \left(\frac{1}{2} + \cos x \right) = 0$ deduce that

$$\pi \approx 3\sqrt{3 \ln \left(\frac{3}{2} \right)}.$$

[3]

(Total 7 marks)

OCR A A2 June 2019 Paper 2 Q10