

QQQ – Core Pure 1 – Chapter 3 – Series (Version 1)

Total Marks: 24

(24 = Platinum, 22 = Gold, 19 = Silver, 16 = Bronze)

1. Find

$$\sum_{r=1}^{20} (r^2 - 2r)$$

Circle your answer.

[1 mark]

- 2450
- 2660
- 5320
- 43680

(Total 1 marks)

AQA A2 June 2021 Paper 1 Q1

2. The positive integer k is such that

$$\sum_{r=1}^k (3r - k) = 90$$

Find the value of k .

[3 marks]

(Total 3 marks)

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3. Using standard summation formulae, find $\sum_{r=1}^n (r^2 - 3r)$, giving your answer in fully factorised form.

[3]

(Total 3 marks)

OCR MEI AS October 2021 Paper 1 Q1

4. Show that

$$\sum_{r=11}^{n+1} r^3 = \frac{1}{4} (n^2 + an + b) (n^2 + an + c)$$

where a , b and c are integers to be found.

[3 marks]

(Total 3 marks)

AQA A2 June 2023 Paper 2 Q7

5. In this question you must show detailed reasoning.

The series S is defined as being the sum of the squares of all positive **odd** integers from 1^2 to 779^2 .

Determine the value of S .

[5]

(Total 5 marks)

OCR A A2 June 2024 Paper 2 Q4

6. An art display consists of an arrangement of n marbles.

When arranged in ascending order of mass, the mass of the first marble is 10 grams.

The mass of each subsequent marble is 3 grams more than the mass of the previous one, so that the r th marble has mass $(7 + 3r)$ grams.

(a) Show that the mean mass, in grams, of the marbles in the display is given by

$$\frac{1}{2}(3n + 17)$$

(3)

Given that there are 85 marbles in the display,

(b) use the standard summation formulae to find the standard deviation of the mass of the marbles in the display, giving your answer, in grams, to one decimal place.

(6)

(Total 9 marks)

Edexcel AS June 2019 Paper 1 Q6