1.10 Series and Summation: 10-minute Pack

EDEXCEL 9FM0 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Priya is investigating the series with general term $u_r = 4r + 3$, for $r = 1, 2, 3, ...$

(a) Show that $\sum_{r=1}^{n} (4r + 3) = n(2n + 5)$. **(3)**

(b) Hence find the value of n for which $\sum_{r=1}^{n} (4r + 3) = 900$. **(3)**

(c) State why the other root of the quadratic in part (b) is rejected. **(1)**

(Total for Question 1 is 7 marks)

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Mark scheme · 1.10 Series and Summation: 10-minute Pack

Question 1

(a) splitting sum into 4*sum r + sum 3 **M1**

(a) substituting sum r = n(n+1)/2 to get 2n(n+1) + 3n **M1**

(a) cso: simplifies to n(2n+5) **A1**

(a) Answer: n(2n + 5)

(b) forming $2n^2 + 5n - 900 = 0$ **M1**

(b) solving the quadratic (formula or factorisation) to get n = 20 or n = -22.5 **M1**

(b) n = 20 cao, rejecting the non-integer negative root **A1**

(b) Answer: n = 20

(c) n must be a positive integer (number of terms), so the negative/non-integer root has no meaning here **B1**

(c) Answer: n represents a number of terms, so it must be a positive integer; the other root is negative.

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