

3.2 Series

3.2.1 Sums of Integers, Squares & Cubes / 3.2.2 Method of Differences

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Total Marks /10

1 Prove that

$$\sum_{r=1}^n \frac{1}{(r+1)(r+3)} = \frac{n(an+b)}{12(n+2)(n+3)}$$

where a and b are constants to be found.

(5 marks)

2 Prove that, for $n \in \mathbb{Z}$, $n \geq 0$

$$\sum_{r=0}^n \frac{1}{(r+1)(r+2)(r+3)} = \frac{(n+a)(n+b)}{c(n+2)(n+3)}$$

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

(5 marks)