1. Given that

$$\frac{2n+1}{n^2(n+1)^2} \equiv \frac{A}{n^2} + \frac{B}{(n+1)^2}$$

(a) determine the value of A and the value of B

(1)

(b) Hence show that, for $n \geqslant 5$

$$\sum_{r=5}^{n} \frac{2r+1}{r^2(r+1)^2} = \frac{n^2 + an + b}{c(n+1)^2}$$

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

(4)

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Question 1 continued

(Total for Question 1 is 5 marks)