

## Topic assessment

1. (i) Write  $\frac{1}{(3r-1)(3r+5)}$  in partial fractions. [3]

(ii) Hence find the sum of the series

$$\frac{1}{2 \times 8} + \frac{1}{5 \times 11} + \frac{1}{8 \times 14} + \dots + \frac{1}{(3n-1)(3n+5)}. \quad [5]$$

2. Use partial fractions to find the sum of the series  $\sum_{r=1}^n \frac{1}{(r+1)(r+2)}$ . [7]

3. (i) Write  $\frac{3r-2}{r(r+1)(r+2)}$  in partial fractions. [4]

(ii) Hence find the sum to  $n$  terms of the series

$$\frac{1}{1 \times 2 \times 3} + \frac{4}{2 \times 3 \times 4} + \frac{7}{3 \times 4 \times 5} + \dots \quad [6]$$

**Total 20 marks**