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$$S_{\infty} = 1 + \frac{3}{5(1)} + \frac{3 \times 4}{5^2(1 \times 2)} + \frac{3 \times 4 \times 5}{5^3(1 \times 2 \times 3)} + \frac{3 \times 4 \times 5 \times 6}{5^4(1 \times 2 \times 3 \times 4)} + \dots$$

M1

$$S_{\infty} = 1 + \frac{3}{1!} \left(\frac{1}{5}\right)^1 + \frac{3 \times 4}{2!} \left(\frac{1}{5}\right)^2 + \frac{3 \times 4 \times 5}{3!} \left(\frac{1}{5}\right)^3 + \frac{3 \times 4 \times 5 \times 6}{4!} \left(\frac{1}{5}\right)^4 + \dots$$

M1

$$S_{\infty} = 1 + \frac{-3}{1!} \left(-\frac{1}{5}\right)^1 + \frac{(-3)(-4)}{2!} \left(-\frac{1}{5}\right)^2 + \frac{(-3)(-4)(-5)}{3!} \left(-\frac{1}{5}\right)^3 + \frac{(-3)(-4)(-5)(-6)}{4!} \left(-\frac{1}{5}\right)^4 + \dots$$

M1

$$S_{\infty} = \left(1 - \frac{1}{5}\right)^{-3}$$

M1

$$S_{\infty} = \frac{125}{64}$$

B1

[5]

[5 marks]