

Question	Scheme	Marks	AOs
4(a)	$\frac{1}{(5r-2)(5r+3)} \equiv \frac{A}{5r-2} + \frac{B}{5r+3} \Rightarrow A = \dots, B = \dots,$ $\left( \text{NB } A = \frac{1}{5} \quad B = -\frac{1}{5} \right)$	M1	3.1a
	$\sum_{r=1}^n \frac{1}{(5r-2)(5r+3)}$ $\frac{1}{5} \left( \frac{1}{3} - \frac{1}{8} + \frac{1}{8} - \frac{1}{13} + \dots + \frac{1}{5n-7} - \frac{1}{5n-2} + \frac{1}{5n-2} - \frac{1}{5n+3} \right)$	M1	2.1
	$= \frac{1}{5} \left( \frac{1}{3} - \frac{1}{5n+3} \right)$	A1	1.1b
	$= \frac{1}{5} \left( \frac{5n+3-3}{3(5n+3)} \right)$	M1	1.1b
	$= \frac{n}{3(5n+3)}$	A1	2.2a
		(5)	
(b)	$\sum_{r=10}^{50} \frac{1}{(5r-2)(5r+3)} = f(50) - f(9 \text{ or } 10)$	M1	1.1b
	$= \frac{50}{3(5 \times 50 + 3)} - \frac{9}{3(5 \times 9 + 3)} = \frac{41}{12144}$	A1	1.1b
		(2)	

**(7 marks)**

### Notes

(a)

M1: A complete strategy to find  $A$  and  $B$  e.g. partial fractions

M1: Starts the process of differences to identify the relevant fractions at the start and end

A1: Correct fractions that do not cancel

M1: Attempt common denominator

A1: Correct answer

(b)

M1: Uses the answer to part (a) to calculate  $f(50) - f(9 \text{ or } 10)$

A1: Correct exact answer