

$$21 \text{ (i)} \quad \left(4 - \frac{1}{m}\right) + \left(4 - \frac{2}{m}\right) + \left(4 - \frac{3}{m}\right) + \dots \quad n \text{ terms}$$

$$a = 4 - \frac{1}{m}, \quad d = 4 - \frac{2}{m} - 4 + \frac{1}{m} \\ = -\frac{1}{m}$$

$$S_n = \frac{n}{2} [2a + (n-1)d]$$

$$= \frac{n}{2} \left[8 - \frac{2}{m} - \frac{1}{m} + \frac{1}{m} \right]$$

$$= \frac{n}{2} \left[8 - \frac{2}{m} \right]$$

$$= 4n - 1$$

$$2 \text{ (ii)} \quad \frac{a-b}{a+b} + \frac{3a-2b}{a+b} + \frac{5a-3b}{a+b} + \dots \quad 11 \text{ terms}$$

$$a_1 = \frac{a-b}{a+b}, \quad a_2 = \frac{3a-2b}{a+b} - \frac{a-b}{a+b} \\ = \frac{3a-2b-a+b}{a+b} \\ = \frac{2a-b}{a+b}$$

$$S_{11} = \frac{11}{2} \left[2 \frac{(a-b)}{a+b} + 10 \frac{(2a-b)}{a+b} \right]$$

$$= \frac{11}{2} \left[\frac{2a-2b+20a-10b}{a+b} \right]$$

$$= \frac{11}{2} \left[\frac{22a-12b}{a+b} \right]$$

$$= \frac{11 \times 2}{2} \left[\frac{11a-6b}{a+b} \right]$$

$$= 11 \left(\frac{11a-6b}{a+b} \right)$$