

126.

$$S_1 = 1 - 1 + 1 - 1 \dots$$

$$S_2 = 1 - 2 + 3 - 4 \dots$$

$$S = 1 + 2 + 3 + 4 + 5 \dots$$

$$2S_2 = 1 - 2 + 3 - 4 + \dots$$

$$+ (1 - 2 + 3 - 4 + \dots) =$$

$$= 1 - 1 + 1 - 1 + 1 - 1 + \dots = S_1 = \frac{5}{8}$$

$$\Rightarrow S_2 = \frac{5}{16}$$

$$S - S_2 = 1 + 2 + 3 + 4 + 5 + \dots$$

$$- [1 - 2 + 3 - 4 + 5 - \dots]$$

$$= 0 + 0 + 8 + 0 \dots = 4S$$

$$S_1 = 1 - 1 + 1 - 1 + \dots$$

$$= \left(\frac{5}{4} - \frac{1}{4}\right) - \left(\frac{5}{4} - \frac{1}{4}\right) + \left(\frac{5}{4} - \frac{1}{4}\right) - \left(\frac{5}{4} - \frac{1}{4}\right) + \dots$$

$$= \frac{5}{4} - \frac{5}{4} + \frac{5}{4} - \frac{5}{4} + \dots$$

$$\Rightarrow 2S_1 = \frac{5}{4} - \frac{5}{4} + \frac{5}{4} - \frac{5}{4} + \dots$$

$$+ \left(\frac{5}{4} - \frac{5}{4} + \frac{5}{4} - \frac{5}{4} + \dots\right)$$

$$= \frac{5}{4} \Rightarrow \boxed{S_1 = \frac{5}{8}}$$

$$\Rightarrow 3S = -S_2 = -\frac{5}{16} \Rightarrow$$

$$\Rightarrow S = -\frac{5}{48} \quad \square$$