

2.87
E1

$$(1) \quad a_1 + a_2 + a_3 = \frac{11}{18}$$

$$\frac{1}{a_1}, \frac{1}{a_2}, \frac{1}{a_3}$$

$\vec{a} = \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$
 $\vec{b} = \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$

$$(2) \quad \frac{2}{a_2} = \frac{1}{a_1} + \frac{1}{a_3}$$

$$\frac{1}{a_2} = 6 \rightarrow \boxed{a_2 = \frac{1}{6}}$$

$$(3) \quad \frac{1}{a_1} + \frac{1}{a_2} + \frac{1}{a_3} = 18$$

$$a_1 + \frac{1}{6} + a_3 = \frac{11}{18}$$

(1) \approx (2)

$$\boxed{a_1 = \frac{1}{9} - a_3}$$

(3) \approx (2)

$$\frac{1}{a_1} + 6 + \frac{1}{a_3} = 18 \quad | \cdot a_1 a_3$$

$$a_3 + a_1 = 12 a_1 a_3$$

$$a_1 + \frac{1}{9} - a_3 = 12 a_3 \left(\frac{1}{9} - a_3 \right)$$

$$\frac{1}{9} = \frac{48 a_3}{9} - 12 a_3^2 \quad | \cdot 9$$

$$1 = 48 a_3 - 108 a_3^2 \quad | : 108$$

$$108 a_3^2 - 48 a_3 + 1 = 0$$

$$a_3 = \frac{1}{3} \rightarrow a_1 = \frac{1}{9}$$

$$a_3 = \frac{1}{9} \rightarrow a_1 = \frac{1}{3}$$

minimales Produkt

$$\frac{1}{3}, \frac{1}{6}, \frac{1}{9}$$

(7) $S_{2n} \stackrel{?}{=} S_n + \frac{1}{3} S_{3n}$

$$\frac{2n}{2} [2a_1 + d(2n-1)] \stackrel{?}{=} \frac{n}{2} [2a_1 + d(n-1)] + \frac{1}{3} \cdot \frac{3n}{2} [2a_1 + d(3n-1)]$$

$$= \frac{n}{2} [2a_1 + d(n-1) + 2a_1 + d(3n-1)]$$

$$= \frac{n}{2} [4a_1 + 4dn - 2d]$$

$$= \frac{2n}{2} [2a_1 + 2dn - d]$$

$$\rightarrow = \frac{2n}{2} [2a_1 + d(2n-1)]$$