A mértani sorozat első n elemének az összege (S_n)

$$S_n = a_1 + a_2 + \dots + a_n$$

$$S_n = a_1 + \cancel{a_1 q} + \cancel{a_1 q^2} + \cancel{a_1 q^3} + \cancel{\dots} + \cancel{a_1 \cdot q^{n-1}} \quad / \cdot q$$

$$q \cdot S_n = \cancel{a_1 q} + \cancel{a_1 q^2} + \cancel{a_1 q^3} + \cancel{a_1 q^4} + \cancel{\dots} + a_1 \cdot q^n$$

$$q \cdot S_n - S_n = a_1 \cdot q^n - a_1$$

$$S_n (q-1) = a_1 (q^n - 1) \quad / : (q-1) \neq 0$$

$$\boxed{S_n = \frac{a_1 (q^n - 1)}{q-1}}$$

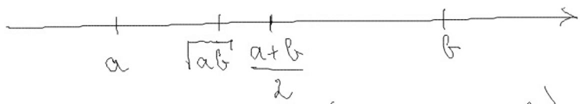
Ha $q = 1$ (konstanssorozat), akkor $S_n = n \cdot a_1$

Mértani közép: $\sqrt{a \cdot b}$ $(a, b \geq 0)$

Pl: $a = 4$ $b = 20$

$\frac{4+20}{2} = 12$

$\sqrt{4 \cdot 20} \approx 8{,}94$



$\sqrt{ab} \leq \frac{a+b}{2}$ $(= \iff a = b)$

Pl. $a_1 = 2$
$q = 3$

2 6 18 54 162

$\sqrt{54 \cdot 6} = \sqrt{2 \cdot 162} = 18$

$a_n = \sqrt{a_{n-k} \cdot a_{n+k}}$ $(n > k)$

$a_n^2 = a_{n-k} \cdot a_{n+k}$

951.

c) $\underset{a_1}{9} + \underset{a_2}{18} + \underset{a_3}{36} + \dots + \underset{a_n}{9216} = S_{11} = \frac{9 \cdot (2^{11} - 1)}{2 - 1} = \underline{\underline{18423}}$

$q = 2$

$a_n = a_1 \cdot q^{n-1}$

$9216 = 9 \cdot 2^{n-1}$

$1024 = 2^{n-1}$

$2^{10} = 2^{n-1}$ $\quad (f(x) = 2^x \nearrow)$

$10 = n - 1$

$11 = n$

$\boxed{953.}$

$$\underbrace{a_1 \quad a_2 \quad a_3}_{26} \quad a_4 \quad \underbrace{a_5 \quad a_6 \quad a_7}_{2106}$$

Hf: bef.
951. d)

$$(*)\quad \begin{aligned} a_1 + a_1q + a_1q^2 &= 26 \\ a_1q^4 + a_1q^5 + a_1q^6 &= 2106 \end{aligned}$$

$$\begin{aligned} a_1(1+q+q^2) &= 26 \\ a_1 \cdot q^4(1+q+q^2) &= 2106 \end{aligned} \quad :$$

$1+q+q^2 \neq 0$

$a_1 \neq 0$

$$\frac{\cancel{a_1}q^4\cancel{(1+q+q^2)}}{\cancel{a_1}\cdot\cancel{(1+q+q^2)}} = 81$$

$$q^4 = 81$$

$q_1 = 3$

$q_2 = -3$

1. eset

$$a_1 + 3a_1 + 9a_1 = 26$$

$$13a_1 = 26$$

$$a_1 = 2$$

2 6 18 54 162 486 1458

2. eset

$$a_1 - 3a_1 + 9a_1 = 26$$

$$7a_1 = 26$$

$$a_1 = \frac{26}{7}$$

$$\frac{26}{7} \quad \frac{-78}{7} \quad \frac{234}{7} \quad \frac{-702}{7} \quad \frac{2106}{7} \quad \frac{-6318}{7} \quad \frac{18954}{7}$$

951. d) $8 + 4 + 2 + \ldots + 2^{-12}$

$$a_1 = 8$$

$$q = \frac{1}{2} = 2^{-1}$$

$$a_n = 2^{-12}$$

$$2^{-12} = 8 \cdot \left(2^{-1}\right)^{n-1}$$

$$2^{-12} = 2^3 \cdot \left(2^{-1}\right)^{n-1}$$

$$2^{-15} = 2^{-n+1}$$

$$-15 = -n + 1$$

$$n = 16$$

$$S_{16} = \frac{8 \cdot \left(0{,}5^{16} - 1\right)}{0{,}5 - 1} \approx 15{,}9998$$