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2.01

$$S_n = \frac{n(a_1 + a_n)}{2}$$

$$S_{18} = \frac{18(92+194)}{2}$$

$$S_{18} = 2574$$

$$a_n = a_1 + (n-1)d$$

$$194 = 92 + (n-1)\cdot 6$$

$$194 = 92 + 6n - 6$$

$$\boxed{n = 18}$$

① Det finns jämnt antal termer i summan. (18)

② Summans värde: 2574

2.02

$$a_n = a_1 k^{n-1}$$

$$S_n = \frac{a_1 k^{n}-1}{k-1}$$

① $a_n = 3 \cdot 3^{n-1}$

$$729 = 3 \cdot 3^{n-1}$$

$$\frac{729}{3} = 3^{n-1}$$

$$243 = 3^{n-1}$$

$$3^5 = 3^{n-1}$$

$$5 = n-1$$

$$\boxed{n = 6}$$

②

$$S_n = \frac{3\cdot(3^6-1)}{3-1}$$

$$S_n = \frac{2184}{2}$$

$$S_n = 1092$$

2.03

$$\sum_{k=1}^{n} (2k)^2 = \frac{2n(n+1)(2n+1)}{3}$$

① Induktion över n. Basfall $n=1$

$$\sum_{k=1}^{1} (2\cdot 1)^2 = 4 \quad \Big| \quad \frac{2\cdot 1(1+1)(2\cdot 1+1)}{3} = 4$$

② IA → Då det gäller för $k+1$ också.

$$\sum_{k=1}^{k+1} (2k)^2 = \left(\sum_{k=1}^{k} (2k)^2\right) + 2\cdot(k+1)^2 = 2k^2 + 2k + 2^2$$