

**Zadatak 32.**

Zbroj drugog i četvrtog člana geometrijskog niza iznosi 30, a njihov je umnožak jednak 144. Odredi zbroj prvih devet članova ovog niza.

Rješenje.

$$a_2 + a_4 = 30 \implies a_4 = 30 - a_2;$$

$$a_2 a_4 = 144 \implies a_2(30 - a_2) = 144 \text{ te imamo:}$$

$$a_2^2 - 30a_2 + 144 = 0$$

$$(a_2 - 6)(a_2 - 24) = 0$$

$$(a_2)_1 = 6, (a_2)_2 = 24$$

(i) $a_2 = 6, a_4 = 24$

$$\frac{a_4}{a_2} = q^2 = 4 \implies q_{1,2} = \pm 2 \implies (a_1)_1 = 3, (a_1)_2 = -3$$

$$\implies 3, 6, 12, 24, \dots \text{ ili } -3, 6, -12, 24, \dots$$

(ii) $a_2 = 24, a_4 = 6$

$$\frac{a_4}{a_2} = q^2 = \frac{1}{4} \implies q_{3,4} = \pm \frac{1}{2} \implies (a_1)_3 = 48, (a_1)_4 = -48$$

$$\implies 48, 24, 12, 6, \dots \text{ ili } -48, 24, -12, 6, \dots$$

$$(S_9)_1 = 3 \cdot \frac{2^9 - 1}{2 - 1} = 3 \cdot 511 \implies (S_9)_1 = 1533;$$

$$(S_9)_2 = -3 \cdot \frac{(-2)^9 - 1}{-2 - 1} = -2^9 - 1 \implies (S_9)_2 = -513;$$

$$(S_9)_3 = 48 \cdot \frac{\left(\frac{1}{2}\right)^9 - 1}{\frac{1}{2} - 1} = 48 \cdot \frac{\frac{1 - 512}{512}}{-\frac{1}{2}} \implies (S_9)_3 = \frac{1533}{16};$$

$$(S_9)_4 = -48 \cdot \frac{-\frac{1}{2^9} - 1}{-\frac{1}{2} - 1} = -48 \cdot \frac{\frac{-1 - 512}{512}}{-\frac{3}{2}} \implies (S_9)_4 = -\frac{513}{16}.$$