

$$a_n = \frac{1}{r} \quad 1, 2$$

$$a = \frac{1}{r}$$

$$q = 2$$

$$a_4 = aq^3 = \frac{1}{r} \times 8 = 8$$

$$a_{10} = aq^9 = \frac{1}{r} \times 512 = 512 \checkmark \quad (\text{الف})$$

$$\frac{a_{10}}{a_4} = \frac{aq^{10}}{aq^4} = q^6 = 2^6 = 64 \checkmark \quad (-)$$

$$\frac{a_{10}}{a_4} = \frac{aq^{10}}{aq^4} = q^6 = 2^6 = 64 \checkmark \quad (-)$$

$$512 \times 64 = \sqrt{32768} = 181 \checkmark$$

$$a_n = \frac{1}{r} \times 2^n = 128 \Rightarrow 2^n = 128 \Rightarrow n = 7 \checkmark$$

$$\frac{a^1}{a^4} = \frac{aq^1}{aq^4} = q^3 = \frac{q^4}{12} = 1 \Rightarrow q = 2$$

$$a \times 2^6 = 12$$

$$a = \frac{12}{2^6} = \frac{12}{64} = \frac{3}{16}$$

$$a_{10} = aq^9 = \frac{3}{16} \times 2^9 = 31.5 \checkmark$$

$$a_1 \times a_9 = a_3 \times a_7 = 1^2 = 1 \checkmark$$

$$a_1 \times a_9 \times a_3 \times a_7 \times a_5 = 1 \times 1 \times 1 \times 1 \times 1 = 1$$

$$a_1 \times a_9 = a_3 \times a_7$$

$$a_3 \times a_7 = a_5 \times a_5$$

$$a_1 \times a_9 \times a_3 \times a_7 \times a_5 = 1 \times 1 \times 1 \times 1 \times 1 = 1$$

$$(a_5)^2 = 1 \times 1 \times 1 \times 1 \times 1 = 1$$

$$a_5 = 1 \checkmark$$

$$r^a \quad f \sqrt{r} \quad r^b$$

$$\frac{a+b}{r} = \frac{a}{r} = 2, 1 \checkmark$$

$$f \sqrt{r} = \sqrt{r^2}$$

$$r^a \times r^b = \sqrt{r^2} \times \sqrt{r^2}$$

$$r^{a+b} = r^2 \Rightarrow a+b = 2$$

$$a_3 \times a_{11} = a_5 \times a_9$$

$$(x+1)(1-x) = x^2$$

$$x - x^2 + 1 - x = x^2 \Rightarrow -x^2 + 1 = x^2$$

$$2x^2 = 1$$

$$x^2 = \frac{1}{2}$$

$$x = \pm \frac{1}{\sqrt{2}}$$

$$x = \pm \frac{1}{\sqrt{2}} = \pm \frac{\sqrt{2}}{2}$$

$$x = \pm \frac{\sqrt{2}}{2}$$

ذاتی

9 بیش از

(2)

(2)

(2)

(2)

(1, 75)

$$a + aq^r = 21$$

$$aq + aq^r = 12$$

$$aq(1+q)$$

$$a(1+q^r) \rightarrow \frac{a(r+1)}{a-1} = 21$$

$$\frac{a(1+q^r)}{aq(1+q)} = \frac{(1+q)(1-q+q^r)}{q(1+q)} = \frac{21}{12} = \frac{7}{4}$$

$$3 - 3q + 3q^r = 4q$$

$$3q^r - 6q + 3 = 0$$

$$q^r - 2q + 1 = (q-1)(q-1)$$

$$q = \frac{1}{3} = \frac{1}{3}$$

$$a + aq + aq^r = 12$$

$$\frac{12}{q} + 12 + 12q = 12$$

$$a + aq + aq^r = 12$$

$$a + aq + aq^r = 12$$

$$(aq)^r = 12$$

$$aq = 3 \Rightarrow a = 9, q = \frac{1}{3}$$

$$\frac{12}{q} + 12 + 12q = 12$$

$$\frac{12}{q} + 12q = 10$$

$$12 + 12q^2 = 10q$$

$$12q^2 - 10q + 12 = 0$$

$$\Delta = b^2 - 4ac = 100 - 36 = 64$$

$$q = \frac{10 \pm \sqrt{64}}{24} \Rightarrow q = \frac{1}{3}$$

$$a_n = 2, 6, 18, \dots$$

$$a = 2$$

$$q = 3$$

$$S_{10} = 2 \left(\frac{3^{10} - 1}{3 - 1} \right) = 3^{10} - 1 = 59049$$

$$a_{10} = 2 \times 3^9 = 11808$$

$$(a_1 \times a_{10})^5 = (2 \times 11808)^5 = (23616)^5 = 23616^5 = 2^{10} \times 3^{45}$$

$$a, aq, aq^2, aq^3, \dots, a(a-1), aq(a-1), aq^2(a-1), aq^3(a-1), \dots$$

$$(aq - a), (aq^2 - aq), (aq^3 - aq^2), \dots$$

$$aq - a = a(q-1)$$

$$aq^2 - aq = aq(q-1)$$

$$aq^3 - aq^2 = aq^2(q-1)$$

$$\frac{aq^n(q-1)}{aq^{n-1}(q-1)} = \frac{q^n}{q^{n-1}} = q$$

دنباله هندسی است، قدر نسبت آن q همان قدر نسبت تالی فوارده

$$a, a+d, a+2d, \dots$$

$$S_n = a + (a+d) + (a+2d) + \dots + (a+(n-1)d)$$

$$S_n = (a+(n-1)d) + (a+(n-2)d) + \dots + a$$

$$2S_n = [a + a + (n-1)d] + [a + (a + (n-2)d)] + \dots + [a + a]$$

$$2S_n = n(2a + (n-1)d) \Rightarrow S_n = \frac{n}{2}(2a + (n-1)d)$$

$$S_n = a + aq + aq^2 + \dots + aq^{n-1}$$

$$qS_n = aq + aq^2 + aq^3 + \dots + aq^n$$

$$S_n - qS_n = (a + aq + aq^2 + \dots + aq^{n-1}) - (aq + aq^2 + \dots + aq^n)$$

$$S_n - qS_n = a - aq^n$$

$$S_n(1-q) = a(1-q^n)$$

$$S_n = \frac{a(1-q^n)}{(1-q)} \quad q \neq 1 \quad \frac{a(q^n-1)}{q-1}$$