

$$a, aq, aq^2$$

$$a + aq + aq^2 = r$$

$$a + aq + aq^2 = a^2 q^2 \rightarrow (aq)^2 = r$$

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

$$aq = r$$

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

$$\left[ \frac{r}{q} (1 + q + q^2) = r \right] \times q$$

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

$$r q^2 - 14q + r = 0$$

$$\Delta = b^2 - 4ac = 14^2 - r(r) = 14^2 - r^2$$

$$r^2 = 14^2$$

$$q = \frac{14 \pm 14}{r}$$

$$q = r \times \boxed{q = \frac{1}{r}}$$

$$a_1 = x^r + r \quad a_r = rx \quad a_r = x^r - r$$

$$x^r - rx - r = 0$$

$$x^r = rx + r$$

$$x = \frac{r \pm \sqrt{r^2 + r^2}}{r}$$

$$x = \frac{r \pm r}{r} \quad x = -r \quad x = r \rightarrow x = \pm r$$

$$x = r \quad r, r, r \checkmark$$

$$x = -r \quad r, -r, r \times$$

$$\frac{a_r}{a_1} = \frac{a_r}{a_1}$$

$$\frac{rx}{x^r + r} = \frac{x^r - r}{rx}$$

$$rx^r = x^r + r - r$$

$$S_v = a_1 \frac{1 - a^v}{1 - a}$$

$$S_v = r \times \frac{1 - (\frac{1}{r})^v}{1 - \frac{1}{r}}$$

$$a_1 = r r$$

$$S_\infty = a_1 (1 + q + q^2 + q^3 + q^4)$$

$$r r \times \left( \frac{14}{r} \right) = S_\infty$$

$$\frac{r r \times 14}{r} = r r \checkmark$$

$$d = \frac{r - 1}{a + 1} = \frac{r}{r} = 1$$

$$A = a_1 + r d = 1 + r \times 1 = r + 1$$

$$q^{n+1} = \frac{b}{a}$$

$$q^r = \frac{r}{1} = r \quad q = -r \quad B = -r \quad B = 1 \times q^r = r = 1$$

$$A + B = r + 1 + r = r + 1 \checkmark$$

$$A + B = r, 1$$

$$a_1 = -r \quad a_r = \frac{-r}{r}$$

$$d = a_r - a_1 = \frac{-r}{r} - (-r) = -1 + r$$

$$d = \frac{-r + r^2}{r} = \frac{1}{r}$$

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

$$a_{1.1} = a_1 + 1 \times d$$

$$-r + 1 = 1$$

$$t_n = 1$$

$$t_n = t_1 q^v$$

$$1 = r q^v$$

$$q^v = \frac{1}{r}$$

$$\boxed{q = \frac{1}{r}} \checkmark$$

$$a_r = a_1 + rd \quad a_v = a_1 + vd \quad a_q = a_1 + nd$$

(1.5)

$$(av)^r = a_v \cdot a_q \rightarrow \text{در تصاعد هندسی}$$

$$(a_1 + vd)^r = (a_1 + rd)(a_1 + nd)$$

$$a_1^r + r a_1 v d + r^2 v^2 d^2 = a_1^r + r a_1 d + r^2 n d^2$$

چون ضریبها برابر است:

$$r a_1 d + r^2 v d^2 = 0 \xrightarrow{\div r} a_1 d + r v d^2 = 0 \rightarrow d = -\frac{a_1}{r} \checkmark \quad \underline{d = 0}$$

$$a_r, a_f, a_n$$

$$\frac{a + rd}{a + d} = \frac{a + vd}{a + rd}$$

$$rd(d - a) = 0$$

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$$a_r = a + d$$

$$d - a = 0$$

$$a_r = a + rd$$

$$d = a$$

$$a_n = a + vd$$

$$a + rd = rd$$

$$(a + rd)^r = (a + d)(a + vd)$$

$$a + d = rd$$

$$a^r + r a d + r^2 d^2 = a^r + r a d + v d^2$$

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

$$-rad + rd^2 = 0$$

$$t_{10} = \frac{1}{r} \times r^9 = 128 \checkmark$$

$$\frac{a + rd}{a + d} = r$$

$$\frac{a + vd}{a + rd} = r$$

$$ra_q, ra_q^r, a_q^r$$

$$r(ra_q^r) = ra_q + a_q^r$$

$$q = 0 \times \underline{q^r - rq + r = 0}$$

(3)

$$\downarrow$$

$$a \neq 0 \quad ra_q^r = ra_q + a_q^r$$

$$(q-1)(q-r) = 0$$

$$ra_q^r = ra_q + a_q^r \quad \div a$$

$$q = 1 \times \boxed{q = r} \checkmark$$

$$q^r - rq^r + r = 0$$

در دنباله هندسی  
غیر ثابت

$$q(q^r - rq + r) = 0$$

$$d = \frac{v}{r} - r = -\frac{1}{r}$$

$$(a_n + y)^r = (a_r + y)(a_{1r} + y)$$

$$q = \frac{a_n + k}{a_{1r} + k} = \frac{r \cdot d}{r \cdot d + rd} = \frac{r}{ra}$$

$$a_n = x$$

$$(x + y)^r = (x - rd + y)(x + rd + y)$$

$$\frac{r}{ra} = \boxed{\frac{a}{r}} \checkmark$$

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$$a_r = x - rd$$

$$x^r + rxy + y^r = x^r + dx + rxy - r \cdot d^r + y^r$$

$$a_{1r} = x + rd$$

$$dx + dy + r \cdot d^r = 0 \Rightarrow d(x + y - r \cdot d) = 0$$

$$x + y = r \cdot d$$

$$\downarrow$$

$$t_1 = a \quad t_r = aq^r \quad t_v = aq^r$$

$$a_1 = a, a_q^r = a_1 + qd = a_1 + q(a_1(q^r - 1)) = a_1(1 + q(q^r - 1))$$

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$$a(1 + q^r + q^r) = v^r$$

$$a_1 q^r = a_1(1 + q(q^r - 1)) \quad d a_1(q^r - 1) = \boxed{v} \checkmark$$

$$a_1 = a \quad a_r = aq^r \quad a_{10} = aq^r$$

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

$$a_1(1 + r + rf) = v^r$$

$$a_{10} = a_1 + ad$$

$$d = a_1(q^r - 1)$$

$$a_1 = 1$$

$$q^r = aq^r - 1$$

$$x^r - qx + 1 = 0 \quad x = 1 \quad x = 1$$

(6)

حالت دوم:  $q = 1 \quad d = 0$   
(دنباله ثابت)