

$$t_1 = f_0$$

$$t_f = 91$$

$$d = \frac{t_m - t_n}{m - n} = \frac{91 - f_0}{f - 1} = v$$

$$t_n = vn + 33 \Rightarrow vn + 33 = 208 \Rightarrow vn = 175 \Rightarrow \boxed{n = 25}$$

۲۵ آسیرت جمله برابر ۲۰۸ می باشد.

$$100 \leq vn + 3 \leq 999$$

$$97 \leq vn \leq 996$$

$$\frac{97}{v} \leq n \leq \frac{996}{v}$$

$$13 \leq n \leq 142 \Rightarrow 14 \leq n \leq 142 \Rightarrow 142 - 14 + 1 = \boxed{129}$$

$$a_{n+1} + a_{n+2} + a_{n+3} = -4n + 12 \Rightarrow 3A + 3(n+1)d = 3A + 3nd + 3d$$

$$a_n = A + (n-1)d \Rightarrow 3A + 3nd + 3d = -4n + 12$$

$$3d = -4 \Rightarrow d = -\frac{4}{3}, 3A + 3d = 12 \Rightarrow 3A - 4 = 12 \Rightarrow A = 9$$

$$a_n = 9 + (n-1)(-\frac{4}{3}) = \frac{1}{3}(12 - 4n)$$

$$a_1 = \frac{1}{3}(12 - 4) = \frac{8}{3}, a_{14} = \frac{1}{3}(12 - 56) = -\frac{44}{3} \Rightarrow a_{14} + a_1 = -\frac{44}{3} + \frac{8}{3} = -\frac{36}{3} = \boxed{-12}$$

$$a_3 = r^x - 1, a_1 = r^{x+1}, a_{13} = r^{13-x} - 3 \Rightarrow a_3 = 3, a_1 = 1, a_{13} = 13$$

$$a_1 - a_3 = a_{13} - a_1 \Rightarrow r^{x+1} - (r^x - 1) = (r^{13-x} - 3) - (r^x - 1)$$

$$a_3 + a_1 + a_{13} = 3 + 1 + 13 = 17$$

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$$\Rightarrow r^{x+1} - r^x + 1 = r^{13-x} - 3 - r^x + 1 \Rightarrow r^{x+1} = r^{13-x} - 3 - r^x$$

$$\Rightarrow r^{x+1} = r^{13-x} - 3 - r^x \Rightarrow r^{13-x} - r^{x+1} - r^x - 3 = 0 \Rightarrow y = r^x$$

$$\Rightarrow 0 = y^2 - 2y - 3 = (y-3)(y+1) \Rightarrow y = 3 \text{ or } y = -1 \Rightarrow r^x = 3 \text{ or } r^x = -1 \Rightarrow \boxed{x = 2}$$

$$a_{12} - a_{10} = 2$$

$$a_{12} + a_{10} = 20$$

$$a_{10} = a_1 + 9d, a_{12} = a_1 + 11d \Rightarrow (a_1 + 11d) - (a_1 + 9d) = 2 \Rightarrow 2d = 2 \Rightarrow \boxed{d = 1}$$

$$(a_1 + 11d) + (a_1 + 9d) = 20 \Rightarrow 2a_1 + 20d = 20 \Rightarrow 2a_1 + 20 = 20 \Rightarrow \boxed{a_1 = -10}$$

$$a_{21} = a_1 + 20d = -10 + 20(1) = \boxed{10}$$

$S_1 = \frac{\Delta}{p} (Pa + Pd) = \Delta(\alpha + Pd)$ $S_r = \frac{\Delta}{p} ((\alpha + \Delta d) + (\alpha + qd)) = \frac{\Delta}{p} (Pa + Pd) = \Delta(\alpha + Pd)$ $\Delta(\alpha + Pd) = \frac{1}{p} \times \Delta(\alpha + Pd) \xrightarrow{\times p} 1 \Delta(\alpha + Pd) = \Delta(\alpha + Pd)$ $\Rightarrow 1\Delta\alpha + Pd = \Delta\alpha + Pd \Rightarrow 1\alpha = \Delta d \Rightarrow \alpha = \frac{d}{p}$ $\alpha_r = \alpha + d = \frac{d}{p} + d = \frac{Pd}{p} \Rightarrow \frac{\alpha_r}{\alpha} = \frac{\frac{Pd}{p}}{\frac{d}{p}} = \frac{Pd}{d} = \frac{p}{q}$ جمله ۵ و ۶ مساوی باشند پس $\frac{p}{q} = \frac{p}{q}$ است.	۶
$t_n = t_{n-p} + 1\Delta$ $\alpha + (n-1)d = [\alpha + (n-p)d] + 1\Delta$ $\alpha + (n-1)d = \alpha + (n-p)d + 1\Delta$ $(n-1)d - (n-p)d = 1\Delta$ $pd = 1\Delta \Rightarrow d = \Delta$ $\xrightarrow{\text{مثال}} \frac{f_0\alpha + 1p_0}{\alpha + p_0} = (f_0)$ $t_\omega = \alpha + Pd = \alpha + p_0$ $t_v = \alpha + qd = \alpha + \frac{p_0}{q}$ $t_q = \alpha + Pd = \alpha + p_0$ $t_q - t_\omega = (t_q - t_\omega)(t_q + t_\omega)$ $t_q - t_\omega = \alpha + p_0 - (\alpha + p_0) = 0$ $t_q + t_\omega = \alpha + p_0 + (\alpha + p_0) = 2\alpha + 2p_0$ $p_0 \times (\alpha + p_0) = f_0 \alpha + 1p_0$	۷
$\alpha_1 = p(1 - q\sqrt{p}) = p - 1p\sqrt{p}$ $\alpha_{1f} = p + \sqrt{p}$ $d = \frac{\alpha_{1f} - \alpha_1}{n+1} \Rightarrow \frac{(p + \sqrt{p}) - (p - 1p\sqrt{p})}{1p} = \frac{1p\sqrt{p}}{1p} = \sqrt{p}$ $d = \frac{b-a}{n+1}$	۸
$f_n - 1 = (fn - p) + p = fn - 1$ $\alpha_{fn-1} = p, \alpha_1 = p$ $\alpha_{n+1} = 11$ $p = p + (fn - p)d \Rightarrow d = \frac{p_0}{fn - p} = \frac{1\Delta}{fn - 1} \Rightarrow \alpha_{n+1} = p + nd = 11$ $\Rightarrow p + n \times \frac{1\Delta}{fn - 1} = 11 \Rightarrow n \times \frac{1\Delta}{fn - 1} = 9 \Rightarrow 1\Delta n = 9(fn - 1) = 11n - 9$ $pn = 9 \Rightarrow \boxed{n=3}$ $p[2, 1, 11, 14, 17, 20, 23, 26, 29], p_2 \quad p(3) + (-3) = 9$ ن برابر ۳ است	۹
$\alpha_n + \alpha_{n+p} = \alpha_p + \alpha_{1v}$ $\alpha_p + \alpha_{1v} = p\alpha_1, \quad p\alpha_{n+p} = \alpha_n + \alpha_{n+p} \Rightarrow \alpha_{n+p} = \alpha_1 \Rightarrow n=1$ $\frac{n}{p} = \frac{1}{p} = f \quad f \text{ مساوی باشد } \Rightarrow \alpha_1 = p\alpha_f \Rightarrow \alpha_1 = \alpha_1 + Pd, \alpha_f = \alpha_1 + \frac{Pd}{1}$ $\alpha_1 + Pd = p\alpha_1 + qd \Rightarrow -p\alpha_1 - Pd = 0 \Rightarrow \alpha_1 = -d$ $\alpha_m = \alpha_1 + (m-1)d \Rightarrow -d + (m-1)d = (m-2)d \Rightarrow \boxed{m=2}$ جمله ۵ و ۶ برابر با صفر است.	۱۰