

سوال ۱)

$$a_1 = f, \quad a_2 = f^2, \quad d = \frac{f^2 - f}{f - 1} = \frac{f}{f - 1} \Rightarrow d$$

$$v_n + b = r$$

$$b = 13$$

$$v_n + r^3 = r \cdot \lambda$$

$$v_n = 175$$

$$n = 20$$

$$d = \frac{175 - 1}{20} = 8.7$$

سوال ۲)

$$1, 1, \dots, 99V$$

$$a_1$$

$$a_n$$

$$\frac{99V - 1.1}{V} + 1 = 129$$

سوال ۳)

$$a_{11} + a_{12} = a_{13} + a_{14} = a_{15} + a_{16}$$

$$n=10 \Rightarrow a_{11} + a_{12} + a_{13} = -f \lambda$$

$$m=11 \Rightarrow a_{12} + a_{13} + a_{14} = -\lambda f$$

$$\Rightarrow \underbrace{a_{12} + a_{13} + a_{14}}_{a_{12} + a_{13}} + \underbrace{a_{15} + a_{16}}_{a_{15} + a_{16}} = -10f$$

$$3(a_{12} + a_{13}) = -10f \Rightarrow a_{12} + a_{13} = -\frac{10f}{3}$$

سوال ۴)

$$r^{2n} - r^{n+1} - r^{n+1} - r^n - 1 \rightarrow r^{2n} - r^{n+1} - r^n - 1 = 0$$

$$\Delta = b^2 - 4ac \Rightarrow 9 - 4(-f)(-f) = 25 \Rightarrow \frac{b \pm \sqrt{\Delta}}{2a} = \frac{-b \pm \sqrt{\Delta}}{2a}$$

$$a_1 = r^2 - 1 \rightarrow f - 1 > r$$

$$a_2 = r^{n+1} = r^2 \cdot r^n$$

$$a_{12} = r^2 - r = 13$$

$$12 + 13 + 13 = 38$$

سوال ۵)

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

$$a_{12} + a_{10} = 25$$

$$-2a_{10} = 20 - 25 \Rightarrow a_{10} = -2.5$$

$$a_{12} - a_{10} = 20 \Rightarrow a_{12} = 17.5$$

$$a_{10} = 10 \Rightarrow \frac{10 - 1}{r} = 9 \Rightarrow d = 1.1$$

$$a_{11} = a_{12} + 9d = 17.5 + 9(1.1) = 27.4$$

سوال ۶)

$$a_1 + a_2 + a_3 + a_4 + a_5 = \frac{d}{r} (r a_1 + 4d)$$

$$\frac{1}{r} (a_1 + a_2 + a_3 + a_4 + a_5)$$

$$\frac{d}{r} (r a_1 + 4d) = \frac{1}{r} \times \frac{d}{r} (r a_1 + 4d)$$

$$\frac{d}{r} (r a_1 + 4d) = \frac{d}{r} (r a_1 + 4d)$$

$$r a_1 + 4d = \frac{r}{r} a_1 + \frac{4d}{r} \Rightarrow r a_1 = 4d \Rightarrow a_1 = \frac{4d}{r}$$

$$\frac{a_2}{a_1} = \frac{a_1 + d}{a_1} = \frac{\frac{4d}{r} + d}{\frac{4d}{r}} = \frac{4d + r d}{4d} = \frac{4 + r}{4} = 3$$

سوال ۷) $t_n = t_{n-2} + 15 \Rightarrow t_n - t_{n-2} = 15 \rightarrow n=2 \rightarrow t_2 - t_0 = 15d$
 $t_9 = n=9 \rightarrow t_9 + 15$
 $t_0 \rightarrow n=0 \rightarrow t_2 + 15$

$$t_9 - t_0 \Rightarrow (t_9 - t_0)(t_9 + t_0) \rightarrow (t_9 + 15 - t_0)(t_9 + 15 + t_0)$$

$$20 \times (2t_1 + 15) = 15$$

$$20t_1 + 150 \rightarrow \frac{20t_1 + 150}{20} = 15$$

$d = 15$
 $2t_1 + 15d = 20 \rightarrow 2t_1 + 15(15) = 20$

سوال ۸) $a_1 = 2(1 - \sqrt{3})$

$$d = \frac{2 + \sqrt{3} - 2(1 - \sqrt{3})}{2 + 1} = 2 + \sqrt{3} - 2 + 2\sqrt{3} = 2\sqrt{3}$$

$$a_n = 2 + \sqrt{3}$$

$12 + 1$
تعداد رابطه ها

$$\frac{2\sqrt{3}}{2\sqrt{3}} = \sqrt{3} = d$$

سوال ۹)

$$d = \frac{32 - 2}{2n - 1} \Rightarrow \frac{15}{2n - 1}$$

بسط می ده
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$$a_{n+1} = 11 \rightarrow a_1 + nd = 11 \Rightarrow 2 + nd = 11$$

$$n \left(\frac{15}{2n-1} \right) = 9$$

$n = 2$

سوال ۱۰)

$$a_n + a_{n+2} = a_2 + a_{10}$$

$$n + n + 2 = 2 \Rightarrow 2n = 14 \Rightarrow n = 7$$

$$\frac{a_n}{a_2} = 2$$

$$\frac{a_n}{a_2} = 2 \Rightarrow \frac{a_1 + nd}{a_1 + d} = 2 \rightarrow a_1 + nd = 2a_1 + 2d$$

$$-2d = 2a_1$$

$$-d = a_1$$

$$a_1 + (n-1)d = 0 \rightarrow a_1 + (n-1)a_1 = 0$$

$$a_1 - na_1 + a_1 = 0 \Rightarrow 2a_1 - na_1 = 0$$

$$a_1(2 - n) = 0$$

$$n = 2 \rightarrow \text{پسند}$$

$$\hookrightarrow a_1 = 0 \rightarrow d = 0$$