

کلاس : دهم دفتر ۲

پایه نهم ششگانه : ۱۳

نام و نام خانوادگی : آلا و ساره بیر

$$a_1 = 40 \quad a_4 = 61 \rightarrow a_4 = a + 3d \rightarrow 61 = 40 + 3d \rightarrow 21 = 3d \rightarrow d = 7$$

$$a_n = a + (n-1)d \rightarrow 201 = 40 + (n-1)7 \rightarrow 201 = 40 + 7n - 7 \rightarrow 175 = 7n \rightarrow n = 25$$

جواب : ۲۵

$$101, 115, 129, \dots \quad a_n = 7n + 101$$

$$100 \leq 7n + 101 < 1000$$

$$-1 \leq 7n < 899 \rightarrow \frac{-1}{7} \leq n < \frac{899}{7}$$

$$0 \leq n < 128, 4 \rightarrow 128$$

جواب : ۱۲۸

$$a_{n+1} + a_{n+2} + a_{n+3} = -6n + 12$$

$$a_{10} + a_{11} =$$

$$a + nd + a + (n+1)d + a + (n+2)d = -6n + 12 \rightarrow 3a + 3nd + 3d = -6n + 12$$

$$3d = -6 \rightarrow d = -2 \quad 3a + 3d = 12 \xrightarrow{d=-2} 3a - 6 = 12 \rightarrow 3a = 18 \rightarrow a = 6$$

$$(a + 4d) + (a + 5d) = 6 + 4(-2) + 6 + 5(-2) = -10$$

جواب : -۱۰

$$r^x - 1, r^{x+1}, r^x$$

$$d = \frac{a_m - a_n}{m - n} \rightarrow d_1 = \frac{r^{x+1} - r^x + 1}{1 - r}$$

$$d_r = \frac{r^x - r - r^{x+1}}{1 - r}$$

$$d_1 = d_r \rightarrow \frac{r^{x+1} - r^x + 1}{1 - r} = \frac{r^x - r - r^{x+1}}{1 - r} \rightarrow r^{x+1} - r^x + 1 = r^x - r - r^{x+1} \rightarrow r^{x+1} + r^{x+1} - r^x - r^x + 1 + r = 0$$

$$2r^{x+1} - 2r^x + 1 + r = 0 \rightarrow 2r^x(r + 1) - 2r^x + 1 + r = 0 \rightarrow 2r^x r + 2r^x + 1 + r - 2r^x = 0 \rightarrow 2r^{x+1} + 1 + r = 0$$

$$a + rd = r \rightarrow a + r = r \rightarrow a = 0$$

$$3 + 1 + 1 = 5$$

جواب : ۵

$$a_{12} - a_{10} = 2 \rightarrow a + 11d - a - 9d = 2 \rightarrow 2d = 2 \rightarrow d = 1$$

$$a_{12} + a_{10} = 28 \rightarrow a + 11d + a + 9d = 28 \rightarrow 2a + 20d = 28 \rightarrow 2a + 20 = 28 \rightarrow 2a = 8 \rightarrow a = 4$$

$$a_{21} = a + 20d \rightarrow -12, 4 + 20 \times 1, 0 = 8$$

جواب : ۸

$$(a_1 + a_2 + a_3 + a_4 + a_5) = \frac{1}{5} (a_5 + a_4 + a_3 + a_2 + a_1) \rightarrow (5a + 10d) = \frac{5a}{5} + \frac{50d}{5}$$

$$15a + 30d = 5a + 10d \rightarrow 10a + 20d = 5a + 10d \rightarrow 5a + 10d = 0 \rightarrow a + 2d = 0 \rightarrow a = -2d$$

$$\frac{a_2}{a} = \frac{a+d}{a} = \frac{\frac{r}{r}d + d}{\frac{1}{r}d} = \frac{r + r}{1} = 2$$

جواب : ۲

$$t_n = (t_1 + (n-1)d) + 1 \rightarrow nd = 1 \rightarrow d = 1$$

$$t_5 = a + 4d \rightarrow a + 4 = 0 \rightarrow a = -4$$

$$t_9 = a + 8d \rightarrow a + 8 = 0 \rightarrow a = -8$$

$$t_{10} = a + 9d \rightarrow a + 9 = 0 \rightarrow a = -9$$

$$\frac{t_9 - t_5}{t_{10}} = \frac{-8 - (-4)}{-9 - (-4)} = \frac{-4}{-5} = \frac{4}{5}$$

جواب : ۴/۵

$$t_9 - t_5 = (t_9 - t_5)(t_9 + t_5) \rightarrow$$

$$\rightarrow (a + 8d - a - 4d)(a + 8d + a + 4d) =$$

$$4d(2a + 12d)$$

$$d = \frac{b-a}{n+1} \rightarrow d = \frac{2+\sqrt{3}-2(1-2\sqrt{3})}{13} = \frac{2+\sqrt{3}-2+4\sqrt{3}}{13} = \frac{5\sqrt{3}}{13} = \boxed{\sqrt{3}} \text{ جواب}$$

$$d = \frac{b-a}{n+1} \quad a_n = a + (n-1)d \rightarrow 11 = 2 + nd \rightarrow 9 = nd$$

$$32 = 2 + (n-2)d \rightarrow 30 = (n-2)d \rightarrow d = \frac{30}{n-2}$$

$$\left\{ \begin{array}{l} 9 = n \left(\frac{30}{n-2} \right) \\ 9(n-2) = 30n \\ 9n - 18 = 30n \\ 21n = 18 \rightarrow n = \frac{18}{21} = \frac{6}{7} \end{array} \right.$$

جمله دهم: $a_{n-3} + 2 = a_{n-1}$

جمله سوم: $2n = 18 \rightarrow \boxed{n = 3}$

$$a_n + a_{n+2} = a_3 + a_{10} \rightarrow (a + (n+1)d) + (a + (n+3)d) = a + 2d + a + 7d$$

$$2a + (2n+4)d = 2a + 9d \rightarrow 2nd = 5d \rightarrow 2n = 5 \rightarrow n = \frac{5}{2}$$

$$a_n = \frac{3a_n}{3} \rightarrow a_n = 3a_n \rightarrow a + nd = 3(a + nd) \rightarrow a + nd = 3a + 9d \rightarrow 2a + 8d = 0$$

$$2(a+d) = 0 \rightarrow a+d = 0 \rightarrow a = -d$$

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

$$0 = -d + nd - d \rightarrow 0 = -2d + nd \rightarrow 2d = nd \rightarrow \boxed{2 = n} \text{ جواب}$$

جمله دوم: $2n = 18$

منتهیات: