

$$t_n = 5, 9, 13, 17, \dots \rightarrow \text{الف) } t_n = 4n + 1 \quad \text{ب) } t_{10} = 4 \times 10 + 1 = 41$$

$$t_n = 6, 10, 14, 18, \dots \rightarrow t_n = 4n + 2$$

$$\text{الف) } S_n = \frac{n}{2} (2a + (n-1)d) \rightarrow S_{10} = \frac{10}{2} (2 \times 6 + 9 \times 4) = 140$$

$$\text{ب) } t_{29} + t_{30} + t_{31} + t_{32} = S_{32} - S_{28} = \frac{32}{2} (12 + 31 \times 4) - \frac{28}{2} (12 + 27 \times 4) = 2176 - 1512 = 664$$

$$t_n = 1 + \sqrt{3}, 2, 3 - \sqrt{3} \rightarrow 1 + \sqrt{3} + d = 2 \Rightarrow d = 1 - \sqrt{3}$$

$$t_{10} - t_{17} = t_1 + 9d - t_1 - 16d = 7d = 7 - 7\sqrt{3}$$

$$a_n = \omega^{2x}, 3 \times \omega^{2x}, \omega^y, \dots \rightarrow \omega^{2x} + d = 3 \times \omega^{2x} = 3 \times \omega^{2x} \rightarrow d = 2 \times \omega^{2x}$$

$$3 \times \omega^{2x} + 2 \times \omega^{2x} = \omega^y \Rightarrow (3+2)\omega^{2x} = \omega^y \Rightarrow \omega^{2x+1} = \omega^y \Rightarrow 2x+1 = y$$

$$b_n = x, 2, y \rightarrow b_1 + b_2 = b_1 + b_2 \Rightarrow x + y = 4 \rightarrow x + 2x + 1 = 4 \Rightarrow x = 1, y = 3 \Rightarrow xy = 3$$

$$a_n = 2x - 4, 2x - 1, 9x \rightarrow a_1 + a_2 = a_2 + a_3 \Rightarrow 1x - 4 = 9x - 2 \Rightarrow x = \frac{1}{4}$$

$$a_n = 3, \omega, \nu, \dots \rightarrow 2n + 1 \quad b_n = 2, \omega, 1, \dots \rightarrow 3n - 1 \rightarrow 2n + 1 = 3n - 1 \Rightarrow n = 2 \Rightarrow a_2 = b_2 = \omega$$

$$\begin{aligned} a_1 + a_2 + a_3 &= 21 \Rightarrow a_1 + a_1 + d + a_1 + 2d = 21 \Rightarrow 3a_1 + 3d = 21 \Rightarrow a_1 + d = 7 \\ a_1 + a_2 + a_3 &= 100 \Rightarrow a_1 + a_1 + d + a_1 + 2d = 100 \Rightarrow 3a_1 + 3d = 100 \Rightarrow a_1 + d = \frac{100}{3} \end{aligned} \Rightarrow d = 21 \Rightarrow a = -21$$

$$a_2 - a_1 + a_1 = a_1 + 2d - a_1 - d + a_1 = a_1 + d = 7 \Rightarrow \frac{a_2 - a_1 + a_1}{a_1} = \frac{7}{-21} = -\frac{1}{3}$$

$$\begin{aligned} a_1 + a_2 + a_3 &= 100 \Rightarrow a_1 + a_1 + d + a_1 + 2d = 100 \Rightarrow 3a_1 + 3d = 100 \Rightarrow a_1 + d = \frac{100}{3} \\ a_2 + a_3 &= 20 \Rightarrow a_1 + d + a_1 + 2d = 20 \Rightarrow 2a_1 + 3d = 20 \Rightarrow 2a_1 + 3(\frac{100}{3} - a_1) = 20 \Rightarrow 2a_1 + 100 - 3a_1 = 20 \Rightarrow -a_1 = -80 \Rightarrow a_1 = 80 \end{aligned}$$

$$3a + 3 \times 3 = 100 \Rightarrow 3a = 91 \Rightarrow a = 30 \Rightarrow a_n = 3n - 1 \Rightarrow a_{10} = 3 \times 10 - 1 = 29$$

$$S_9 = 9 \quad S_2 \Rightarrow \frac{9}{2} (2a + 1d) = \frac{9 \times 3}{2} (2a + 2a) \Rightarrow 9a + 9d = 27a + 27d$$

$$\Rightarrow 9d = 18a \Rightarrow d = 2a$$

$$\frac{a_{10}}{a_1} = \frac{a + 9d}{a + d} = \frac{a + 18a}{a + 2a} = \frac{19a}{3a} = \frac{19}{3}$$

$$a_v = 3\omega \rightarrow a + 4d = 3\omega$$

$$a = 11 \rightarrow 4d = 24 \Rightarrow d = 6 \rightarrow a_4 = 11 + 3 \times 6 = 29$$

$$b_1 = 31$$

$$b_4 = 29 \rightarrow 31 + 3d = 29 \Rightarrow d = -\omega \rightarrow \text{~~31 - \omega, 29 - \omega, 27 - \omega, 25 - \omega~~}$$

$$31 + (-\omega(n-1)) = 29 \Rightarrow n-1 = \omega \Rightarrow n = 4 \rightarrow \text{4 واسطه هندسی قرار دارد}$$