

$t_n = 5, 9, 13, 17, \dots \rightarrow$ الف) $t_n = 4n + 1$ $t_{10} = 4 \times 10 + 1 = 41$ ب)	۱
$t_n = 4, 10, 16, 22, \dots \rightarrow t_n = 6n + 2$ الف) $S_n = \frac{n}{2}(2a + (n-1)d) \rightarrow S_{10} = \frac{10}{2}(2 \times 4 + 9 \times 6) = 240$ ✓ ب) $t_{10} + t_{20} + t_{30} + t_{40} = S_{40} - S_{39} = \frac{40 \times 4}{2} - \frac{39 \times 4}{2} = 40$	۲
$t_n = 1 + \sqrt{3}, 2, 3 - \sqrt{3} \rightarrow 1 + \sqrt{3} + d = 2 \Rightarrow d = 1 - \sqrt{3}$ $t_{10} - t_{17} = t_1 + 9d - t_1 - 16d = -7d = 7 - 7\sqrt{3}$	۳
$a_n = 5^{2x}, 3 \times 5^{2x}, 5^y, \dots \rightarrow 5^{2x} + d = 3 \times 5^{2x} = 3 \times 5^{2x} \Rightarrow d = 2 \times 5^{2x}$ $3 \times 5^{2x} + 5^{2x} = 5^y \Rightarrow (4 \times 5^{2x}) = 5^y \Rightarrow 5^{2x+1} = 5^y \Rightarrow 2x+1 = y$ $b_n = x, 2, y \rightarrow b_1 + b_2 = b_2 + b_3 \Rightarrow x + 2 = 2 + y \Rightarrow x + 2x + 1 = y \Rightarrow x = 1, y = 3 \Rightarrow xy = 3$	۴
$a_n = 2x - 1, 2x - 1, 9x \rightarrow a_1 + a_2 = a_2 + a_3 \Rightarrow 1x - 1 = 9x - 2 \Rightarrow x = \frac{1}{8}$ $\downarrow -3, 0, 3, 6, \dots a_n = 3n - 3 \Rightarrow a_4 = 9$	۵
$a_n = 3, 5, 7, \dots \rightarrow 2n + 1$ $b_n = 2, 5, 8, \dots \rightarrow 3n - 1$ $\rightarrow 2n + 1 = 3n - 1 \Rightarrow n = 2 \Rightarrow a_2 = b_2 = 5$	۶
$a_1 + a_2 + a_3 = 21 \Rightarrow a_1 + a_1 + d + a_1 + 2d = 21 \Rightarrow 3a_1 + 3d = 21 \Rightarrow a_1 + d = 7$ $a_1 + a_2 + a_3 = 100 \Rightarrow a_1 + a_1 + d + a_1 + 2d = 100 \Rightarrow 3a_1 + 3d = 100 \Rightarrow a_1 + d = \frac{100}{3}$ $a_3 - a_2 + a_1 = a_1 + 2d - a_1 - d + a_1 = a_1 + d = 7 \Rightarrow \frac{a_3 - a_2 + a_1}{a_1} = \frac{7}{a_1} = \frac{-1}{3} \Rightarrow a_1 = -21$	۷
$a_1 + a_2 + a_3 = 10 \Rightarrow a_1 + a_1 + d + a_1 + 2d = 10 \Rightarrow 3a_1 + 3d = 10 \Rightarrow a_1 + d = \frac{10}{3}$ $a_2 + a_3 = 20 \Rightarrow a_1 + d + a_1 + 2d = 20 \Rightarrow 2a_1 + 3d = 20$ $3a_1 + 3d = 10 \Rightarrow 3a_1 = 10 - 3d \Rightarrow a_1 = \frac{10 - 3d}{3}$ $\frac{10 - 3d}{3} + d = \frac{10}{3} \Rightarrow 10 - 3d + 3d = 10 \Rightarrow 0 = 0$ $3a_1 + 3 \times 3 = 10 \Rightarrow 3a_1 = 1 \Rightarrow a_1 = \frac{1}{3} \Rightarrow a_n = 3n - 1 \Rightarrow a_{10} = 3 \times 10 - 1 = 29$	۸
$S_9 = 9 S_2 \Rightarrow \frac{9}{2}(2a + 8d) = \frac{9 \times 3}{2}(2a + 2d) \Rightarrow 9a + 36d = 27a + 27d$ $\Rightarrow 9d = 18a \Rightarrow d = 2a$ $\frac{a_{10}}{a_1} = \frac{a + 9d}{a + d} = \frac{a + 18a}{a + 2a} = \frac{19a}{3a} = \frac{19}{3}$	۹

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

$$a = 11 \rightarrow 4d = 22 \Rightarrow d = 5.5 \rightarrow a_{14} = 11 + 3 \times 5.5 = 27.5$$

$$b_1 = 31$$

$$b_{14} = 27 \rightarrow 31 + 3d = 27 \Rightarrow d = -1.33 \rightarrow \text{~~31 - 1.33n~~}$$

$$31 + (-1.33(n-1)) = 27 \Rightarrow n-1 = 3 \Rightarrow n = 4 \rightarrow \text{4 و 3 سطح هفتگی قرار دارد}$$