

الف) $t_n = f_n + 1$ ✓ $t_n = 5, 9, 13, 17, \dots$

ب) $t_{10} = 15 \times 10 + 1 = 151$ ✓ (۲)

$t_n = 4, 10, 16, 22, \dots$

الف) $s_n = \frac{n}{2} (a_1 + a_n) \leq s_n = \frac{n}{2} (2a_1 + (n-1)d) \Rightarrow \frac{10}{2} (2 \times 4 + (10-1) \times 6) = 245$ ✓ (۲)

ب) $t_{10} = 15 \times 10 + 1 = 151$ ✓ $t_{19} = 19 \times 15 + 1 = 286$ و $t_{20} = 20 \times 15 + 1 = 301$

$1 + \sqrt{3}, 2, 3 - \sqrt{3}, \dots$

$t_1 = 1 + \sqrt{3}, t_2 = 2, t_3 = 3 - \sqrt{3}$ $\Rightarrow d = 1 - \sqrt{3}$ (۲)
 $\Rightarrow 2d = 2(1 - \sqrt{3}) = 2 - 2\sqrt{3}$ ✓

$a_n = 2^n, 3 \times 2^n, \dots$

$a_n = 2^n, 3 \times 2^n, \dots \Rightarrow a_{n+1} = 2^{n+1} = 2 \times 2^n = 2a_n$ $r_{n+1} = 2$

$b_n = x, y \Rightarrow 2 = \frac{x+y}{2} \Rightarrow x+y = 4$

$r_{n+1} = 2$ $\Rightarrow \frac{x+y}{2} = 2 \Rightarrow x+y = 4$

$2n-1, 2n-3, \dots$

$t_n = 4n + 2$

$4 \times \frac{1}{2} + 2 = 3$ ✓

$t_1 = 1 \times 4 + 2 = 6$ (۲)

$a_n = 2, 11, 13, 15, 17$
 $b_n = 2, 11, 13, 15, 17$
 $r_{n+1} \Rightarrow r \times (r_0 + 1) = 11$
 $r_{n-1} \Rightarrow r \times (r_0 - 1) = 109$
 $4n - 1 \Rightarrow 4n = 4$
 $4n - 1 = 109 \Rightarrow 4n = 110 \Rightarrow n = 27.5$

$a_1 + a_2 + a_3 = 11 \Rightarrow a_1 + a_2 + a_3 = 11$
 $a_1 + a_2 + a_3 = 109 \Rightarrow a_1 + a_2 + a_3 = 109$
 $a_3 - a_2 + a_1 = ? \Rightarrow \frac{109 - 11 - 11}{-1} = \frac{87}{-1} = -87$
 a_1, a_2, a_3
 $a_1 = 11 - 2a_2 - 2a_3$

$a_1 + a_2 + a_3 = 11 \Rightarrow a_1 + a_2 + a_3 = 11$
 $a_2 + a_3 = 109 \Rightarrow a_2 + a_3 = 109$
 $a_1 = ?$
 $a_1 + 4d = 11 + 4d = 109 \Rightarrow d = 25$
 $a_1 = 11 - 4d = 11 - 100 = -89$

$s_9 = 9s_2 \Rightarrow \frac{9}{2} (a_1 + a_9) = 9 \times \frac{9}{2} (a_1 + a_2) \Rightarrow \frac{9}{2} a_1 + \frac{9}{2} a_9 = \frac{81}{2} a_1 + \frac{81}{2} a_2$
 $\frac{a_9}{a_2} = ?$
 $\frac{a_9}{a_2} = \frac{a_1 + 8d}{a_1 + d} = \frac{11 + 8d}{11 + d} = \frac{11 + 8d}{11 + d} = \frac{11 + 8d}{11 + d}$
 $\frac{1}{2} (a_1 + 8d) - \frac{9}{2} (a_1 + d) = a_1$
 $\frac{1}{2} a_1 + 4d - \frac{9}{2} a_1 - \frac{9}{2} d = a_1 \Rightarrow -4a_1 + \frac{1}{2} d = a_1 \Rightarrow -5a_1 = -\frac{1}{2} d \Rightarrow a_1 = \frac{1}{10} d$

$d = \frac{b - a}{n+1} \Rightarrow -a = \frac{11 - 11}{n+1} \Rightarrow -a = 0 \Rightarrow a = 0$
 $t_1 = 11, t_2 = 11 \Rightarrow t_2 = t_1 + d = 11 \Rightarrow d = 0$
 $n+1 = 10 \Rightarrow n = 9$

$t_1 = 11$
 $t_2 = 11 \Rightarrow t_1 + d = 11 \Rightarrow d = 0$
 $t_2 = t_1 + d = 11 + 0 = 11$