آرشیدا درخشنده

۱- $t_n = 5, 9, 13, 17, \ldots$

الف) $4n+1$ ب) $4(10)+1 = \underline{41}$

۲- $t_n = 6, 10, 14, 18$

الف) $S_n = \frac{n}{2}(2a_1 + (n-1)d) \rightarrow S_{10} = 5(12 + (9)(4)) = 240$

ب) ۴ جمله مشترک = $t_{29}, t_{30}, t_{31}, t_{32}$ $\quad a_1 + 28d + a_1 + 29d + a_1 + 30d + a_1 + 31d$

$4a_1 + 118(4) = 24 + 472$

$= \boxed{496}$

۳- $t_n = 1+\sqrt{3}, 2, 3-\sqrt{3}$ $\quad d = 2 - 1 - \sqrt{3} = 1 - \sqrt{3}$

$t_{25} - t_{23} = a_1 + 24d - a_1 + 22d = 2d$

$2(1-\sqrt{3}) = \boxed{2 - 2\sqrt{3}}$

۴- $a_n = 5^{2x}, 3 \times 25^{x}, 5^{y}$ $\quad 3 \times 5^{2x} = 5^{2x} + 5^{y}$

$b_n = x, 2, y$ $\quad 5 \times 5^{2x} = 5^{y}$ $\quad \therefore 2x+1 = y$

$2x + 1 + x = 4$

$3x + 1 = 4$ $\quad \boxed{x = 1}$ $\quad y = \boxed{3}$ $\quad xy = \boxed{3}$

۵- $2x - 4, 2x - 1, 6x, \ldots$ (+3, +3, +3)

$2x + 2 = 6x$

$2 = 4x$ $\quad x = \frac{1}{2}$

$t_n = 3n - 4$

$t_4 = 12 - 4 = \boxed{6}$

$t_4 = 6\left(\frac{1}{2}\right) + 3 = \boxed{6}$

۶- $a_n = 3, 5, 7, 9, 11, 13, 15, 17$ $\quad 2n+1$ $\quad 2(20)+1 = 41$

$b_n = 2, 5, 8, 11, 14, 17$ $\quad 3n-1$ $\quad 3(20)-1 = 59$

ب)

جملات مشترک: $11, 17, 23, 29, 35, 41$ $\quad c_n = 6n + 5$ $\quad 6n + 5$

۷

۷- $a_1 + a_2 + a_3 = 21$ $\quad a_1 + a_3 + a_5 = 105$ $\quad a_3 - a_2 + a_1 = ?$

$3a_1 + 3d = 21$ $\quad 3a_1 + 6d = 105$ $\quad a_1 + 2d - (a_1 + d) + a_1 =$

$a_1 + d = \frac{21}{3} = 7$ $\quad 3(a_1 + 2d) = 35$ $\quad d + a_1 = 7$

$\Longrightarrow a_1 + d = 7$

$a_1 + 2d = 35$

$a_1 = 7 - 28 = \boxed{-21}$

$d = \boxed{28}$

8- $a_1+a_2+a_3=15$ $\quad a_4+a_5=25$ $\quad a_{10}=?\ a_1+9(3)=2+27=29$

$3a_1+3d=15$ $\quad 2a_1+7d=25$

$a_1+d=5$ $\Rightarrow 5d=15\quad d=3$

$a_1+a_3=10 \rightarrow 2a_1+2d=10$ $\quad a_1=5-3=2$

$a_1 \neq 0$ $\quad a_1+38a_1=39a_1$, $\quad a_1+12a_1=13a_1$ $\Leftarrow \frac{a_{20}}{a_7}=\frac{a_1+19d}{a_1+6d}=\frac{a_1+19(2a_1)}{a_1+6(2a_1)}=3$

$S_9=9S_3$ $\quad \frac{9}{2}(2a_1+8d)=9\times\frac{3}{2}(2a_1+2d)$

$9(a_1+4d)=27(a_1+d)$

$9a_1+36d=27a_1+27d$ $\quad 9d=18a_1$ $\quad d=2a_1$

10- $t_1=38$ $\quad t_4=23$ $\quad \frac{t_m-t_1}{m}=d$

$a_1=11$ $\quad a_7=35$

$11+6d=35$

$6d=24$ $\quad d=4$

$t_1+3(d)=23$ $\quad \frac{13-38}{m+1}=d=\frac{-5}{1}$

$a_4=a_1+3(4)=11+12=23$

38 $\quad 3d=23-38=-15$ $\quad d=-5$ $\quad m=\frac{-25}{-5}=5$

$38,\ 33,\ 28,\ 23,\ 18,\ 13$

جواب $\Leftarrow$ ۴ واسطه حسابی