

15th Aug - 1st year, 1st class

$$\left. \begin{array}{l} a_1 = 6 \\ a_1 + a_2 + \dots + a_n = 41 \end{array} \right\} \Rightarrow r d s \quad (1) \Rightarrow d = V \Rightarrow a_n = V_{n+1}$$

-1

$$V_{n+1} = 41 \Rightarrow V_n = 1 \Rightarrow \boxed{n = 40}$$

$$100 \leq V_{n+1} \leq 999 \Rightarrow 9V \leq V_n \leq 999$$

-2

$$\Rightarrow 13, \dots \leq n \leq 142, \dots \Rightarrow \boxed{13 \leq n \leq 142}$$

$$\left. \begin{array}{l} n=0 \Rightarrow a_1 + a_2 + \dots + a_n = 12 \\ n=1 \Rightarrow a_1 + a_2 + \dots + a_n = 4 \end{array} \right\} a_1 - a_2 = 4 \Rightarrow d = -2$$

-3

$$a_n + d + a_{n+1} + d + \dots + a_{n+14} + d = 4n + 12 \Rightarrow r a_n - (12 - 4n + 12) \Rightarrow a_{n+1} = 2n + 1$$

$$\Rightarrow a_{11} + a_{14} = 14 + 1 = 15 + 1 = \boxed{16}$$

$$d s \quad r(r^x) - r^x + 1 = r^x + 1$$

-4

$$r^{x+1} + r^x + 1 = r^x - r^x \Rightarrow r(r^x) + 1 = r(r^x) - r^x \Rightarrow r^x = r^x \Rightarrow x = r$$

$$\Rightarrow a_{11} + a_{14} = 15 + 1 = 16 \Rightarrow \boxed{16}$$

$$a_{11} - a_{10} = d \Rightarrow r d = d \Rightarrow d = r d$$

-5

$$\Rightarrow a_{10} + a_{10} + r d = r d \Rightarrow r a_{10} = r d \Rightarrow a_{10} = d$$

$$\Rightarrow a_{11} = a_{10} + 11d = d + 11d = 12d$$

$$r(S_{1-n}) = S_{q-10} \Rightarrow \cancel{r} (r a_1 + r d) \times \cancel{r} \neq \cancel{r} (r a_4 + r d) \quad -4$$

$$\begin{aligned} \Rightarrow 4 a_1 + 11 d &= r a_4 + r d \Rightarrow r a_1 + 4 d = a_4 + r d \\ &\Rightarrow r a_1 + 4 d = a_1 + d d \\ &\Rightarrow r a_1 = d \end{aligned}$$

$$\Rightarrow \frac{a_r}{a_1} = \frac{a_1 + r a_1}{a_1} = \boxed{r}$$

$$\Rightarrow r d = 11 d \Rightarrow d = 0$$

$$\Rightarrow \frac{t_1^r - t_0^r}{t_v} = \frac{(t_0 + r t_0)^r - t_0^r}{t_0 + 10} \Rightarrow \frac{t_0^r + r t_0^r + t_0^r - t_0^r}{t_0 + 10} = \frac{t_0 (t_0 + r t_0)}{t_0 + 10} = \boxed{t_0} \quad -5$$

$$d = \frac{r + \sqrt{r} - r_0 \sqrt{r}}{10} = \frac{r \sqrt{r}}{10} = \boxed{\sqrt{r}} \quad -1$$

$$d = \frac{r r - r}{r n - r}$$

$$\begin{aligned} a_{n+1} &= (n+1) d = r + n \left(\frac{r_0}{r n - r} \right) = 11 \Rightarrow n \left(\frac{r_0}{r n - r} \right) = 9 \Rightarrow r_0 n = 4 n - 11 \\ &\Rightarrow 11 = 4 n \Rightarrow \boxed{n = 3} \end{aligned}$$

$$r a_n + r d = r a_n + 11 d \Rightarrow a_n = a_n + d d \Rightarrow a_n = a_n \quad -10$$

$$r a_n = a_n \Rightarrow r a_1 + 9 d = a_1 + 9 d \Rightarrow r d = -r a_1 \Rightarrow -d = a_1$$

$$a_n = a_1 + (n-1) d \Rightarrow 0 = -d(n-1) d \Rightarrow n-1 = 1 \Rightarrow \boxed{n = 2}$$