

$$a_1 = 40, a_4 = 61 \rightarrow a_4 - a_1 = a_1 + 3d - a_1 = 3d = 61 - 40 = 21 \Rightarrow d = 7 \Rightarrow$$

$$a_n = 7n + 33 \quad 7n + 33 = 201 \rightarrow n = 25$$

19, 178

✓

$$\frac{1}{101} \leq \frac{1}{7n+3} \leq \frac{1}{999} \rightarrow 14 \leq n \leq 142 \Rightarrow 142 - 14 + 1 = 129$$

✓

$$a_{n+1} + a_{n+2} + a_{n+3} = -9n + 12 \rightarrow 3a_{n+2} = -9n + 12 \rightarrow a_{n+2} = -3n + 4$$

$$a_n = -3(n-2) + 4 = -3n + 10$$

$$a_1 = -3(1) + 10 = 7 \Rightarrow a_1 + a_{14} = 7 + (-32) = -25$$

$$a_{14} = -3(14) + 10 = -32$$

✓

$$r^x - 1, r^{x+1} - r, r^{2x} - r \rightarrow r^{x+1} - r^x + 1 = r^{2x} - r - r^{x+1} \rightarrow$$

$$r^x(r-1+r^{x-2}) = r^x(r^x - r)$$

13 + 1 + 3 = 24
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$$1 + r^{x-2} = r^x - r \rightarrow r^{x-2}(-1 + r^2) = r$$

$$r^{x-2} = 1 \rightarrow x-2 = 0 \Rightarrow x = 2$$

1, 178

$$\begin{cases} a_{12} - a_{10} = 2 \\ a_{12} + a_{10} = 20 \end{cases} \rightarrow a_{10} + 2d - a_{10} = 2d = 2 \rightarrow d = \frac{2}{2}$$

$$a_{12} = 10 \rightarrow a_{21} = a_{12} + 9d = 10 + \frac{9 \times 2}{2} = \frac{20}{2} = 10$$

✓

$$r \times \frac{\Delta}{r} (a_1 + a_n) = \frac{\Delta}{r} (a_1 + a_n) \sim r a_1 + r a_n = a_1 + a_n \sim$$

$$r a_1 + r a_1 + 1r d = a_1 + n d + a_1 + n d$$

$$2r a_1 + 1r d = 2a_1 + n d$$

$$(r a_1 = d)$$

$$\frac{a_r}{a_1} = \frac{a_1 + d}{a_1} = \frac{r a_1}{a_1} = r$$

Ⓟ ✓

$$\frac{t_9^r - t_0^r}{t_v} = \frac{(t_9 + t_0)(t_9 - t_0)}{\frac{t_0 + t_9}{r}} = r \frac{(t_9 - t_0)}{\epsilon d} = n d = n(\Delta) = \underline{r_1}$$

$$\left[t_n = t_{n-r} + 1\Delta \sim t_\epsilon = t_1 + 1\Delta \rightarrow t_\epsilon - t_1 = r d = 1\Delta \sim d = \Delta \right]$$

Ⓟ ✓

$$d = \frac{t_n - t_0}{\frac{n-1}{r+1}} \sim \frac{r + \sqrt{r} - r + 1r\sqrt{r}}{1r+1} = \frac{1r\sqrt{r}}{1r} = \underline{\sqrt{r}}$$

تقسیم بر
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$$a_1 = r, a_{n+1} = 11, a_{\epsilon n-1} = r r$$

$$d = \frac{a_{n+1} - a_1}{n+1-1} = \frac{11-r}{n} = \frac{r}{n}, d = \frac{a_{\epsilon n-1} - a_{n+1}}{\epsilon n-1-n-1} = \frac{r r-11}{r n-r} = \frac{r 1}{r n-r} \Rightarrow$$

$$\frac{r}{n} = \frac{r 1}{r n-r} \sim r v n - 11 = r 1 n \rightarrow \underline{n = r}$$

Ⓟ ✓

$$a_n + a_{n+\epsilon} = a_r + a_{1v} \sim n + n + \epsilon = 1r + v \sim r n + \epsilon = r_0 \sim n = 1$$

$$a_n = r a_{\frac{n}{r}} \rightarrow a_n = r a_\epsilon \rightarrow a_n - a_\epsilon = a_\epsilon + \epsilon d - a_\epsilon = \epsilon d = r a_\epsilon \sim r d = a_\epsilon$$

$$\boxed{a_r = 0}$$

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