

$$t_2 - t_1 = 3d = 21 \Rightarrow d = 7 \Rightarrow 7n + 53$$

$$7n + 53 = 201 \Rightarrow 7n = 148 \Rightarrow n = 21 \checkmark$$

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$$101, 108, 115, \dots, 997$$

$$\frac{997 - 101}{7} + 1 = 129 \checkmark$$

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$$a_1 + nd + a + (n+1)d + a + (n+2)d = (a + nd + d) = 4n + 12$$

$$\Rightarrow (a + (2d)(n+1)) = 4(-n+2) \Rightarrow a + (d)(n+1) = 2(-n+2)$$

$$a_{10} + a_n = 2a + 2d = 2(a + d) \Rightarrow n = 10 \checkmark$$

$$2(-10 + 2) = -16 \Rightarrow a_{10} + a_n = -16 \checkmark$$

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$$2^{n-1} - 1 + 2 - 3 = 2$$

$$\left. \begin{array}{l} 2^n - 1 = 2 \\ 2^{n+1} = 1 \\ 2^n = 1 \end{array} \right\} 2 \checkmark$$

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$$2 + 2 - 2 = (2^n)(1+2) - 2 = 2 \times 2^n = 2 - 2 = 0 \Rightarrow 1 - 2^n = 0 \Rightarrow 2^n = 1 \Rightarrow n = 0 \Rightarrow 2^n = 1 \Rightarrow 2 - 2^n = 0 \Rightarrow n = 1 \checkmark$$

$$t_{12} - t_{10} = 2 \Rightarrow 2d = 2 \Rightarrow d = 1 \checkmark$$

$$t_{10} + t_{12} = 20 \Rightarrow 2t_1 + 20d = 20 \Rightarrow t_1 + 10d = 10 \Rightarrow t_1 + 2d = 10 \checkmark$$

$$\Rightarrow t_1 = -10 \checkmark$$

$$t_{12} = -10 + 20d \Rightarrow -10 + 20 = 10 \checkmark$$

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$$\left. \begin{aligned} r(a+1 \cdot d) &= ra + r \cdot d \\ ra + r \cdot d &= ra + r \cdot d \end{aligned} \right\} \text{! } a = d \Rightarrow a = \frac{1}{r} d$$

$$\frac{a+d}{a} = \frac{\frac{1}{r}d}{\frac{1}{r}d} = r \quad \checkmark$$

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$$a + d = a + k \Rightarrow d = k \Rightarrow d = a$$

$$r_1 + a = (a+d)r = (a+r \cdot d)r = a + r \cdot d + (r \cdot d - a - r \cdot d) - r \cdot d$$

$$\Rightarrow r \cdot d + r \cdot d = r(a+d) \Rightarrow \frac{r \cdot d + r \cdot d}{a + r \cdot d} = \frac{r \cdot (r + a)}{r + a} = r \quad \checkmark$$

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$$\frac{r + \sqrt{r} - r + r \sqrt{r}}{r + 1} = \frac{r \sqrt{r}}{r + 1} = \sqrt{r} \quad \checkmark$$

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$$1 + (n-1)d = n-1 \quad a_n = a_1 + (n-1)d \Rightarrow r = 1 + ((n-1)-1)d$$

$$\Rightarrow d = \frac{r-1}{n-2} \Rightarrow r = (n-2)d \Rightarrow d = \frac{r}{n-2} \Rightarrow d = \frac{1}{n} \quad n(n-2)$$

$$r \cdot n = 1(n-2) \Rightarrow r \cdot n - r \cdot n = 1 \Rightarrow r = 1 \quad \checkmark$$

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$$a_n + a_{n+1} = a_r + a_{r+1} \Rightarrow \frac{a}{a} + (n-1)d + \frac{a}{a} + n \cdot d = a + r \cdot d + a + r \cdot d$$

$$\Rightarrow r \cdot a + (r \cdot n + r) d = r \cdot a + r \cdot d \quad r \cdot a + (r \cdot n + r) d = r \cdot a + r \cdot d \Rightarrow r \cdot n + r = 1$$

$$n = 1 \quad \checkmark \quad a_n = r \cdot \frac{a}{r} \Rightarrow a_n = a \quad a_n = a + n \cdot d \quad a_r = a + r \cdot d$$

$$\frac{a}{a} a_k = a + (k-1)d = 0 \Rightarrow (k-1)d = 0 \Rightarrow k-1 = 0 \Rightarrow k = 1 \quad \checkmark$$

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