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$$t_1 = 41 \rightarrow t_1 + r d \Rightarrow 41 + 3d = 11 \Rightarrow 3d = 21 \Rightarrow d = 7 \rightarrow t_n = 41 + (n-1)7$$

$$t_x = 198 = 41 + (x-1)7 \Rightarrow (x-1)7 = 157 \Rightarrow x-1 = 22 \Rightarrow x = 23$$

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$$100 \leq 7x + 3 < 1000$$

$$\Rightarrow 97 \leq 7x \leq 997$$

$$\Rightarrow 14 \leq x \leq 142$$

$$\frac{142-14}{1} + 1 = 129$$

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$$\underbrace{d_{n+1} + d_{n+2} + d_{n+3}}_{r d_{n+2}} = -4n + 17 \quad \left\{ \begin{array}{l} r a_{n+2} = -4n + 17 \Rightarrow d_{n+2} = -2n + 8 \\ d_{4+2} = d_6 = -2(4) + 8 = -1 \\ d_{10+2} = d_{12} = -2(10) + 8 = -12 \end{array} \right.$$

$$d_{4+2} = d_6 = -2(4) + 8 = -1$$

$$d_{10+2} = d_{12} = -2(10) + 8 = -12$$

$$d_6 + d_{12} = -1 - 12 = -13$$

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$$a_d = r^{x+1} - r^x + 1 = r^x + 1$$

$$a_d = r^{2x} - r = r(r^x) = r^x(r^x - r) - r \quad \left\{ \begin{array}{l} r^x + 1 = r^x(r^x - r) - r \\ \Rightarrow r^x + r = r^x(r^x - r) \Rightarrow r^x + r = r^{2x} - r^x r \\ \Rightarrow r^x + r^x + r = r^{2x} \\ \Rightarrow r^x + r^x = r^{2x} - r \end{array} \right.$$

$$\Rightarrow r^x + r^x = r^{2x} - r$$

$$\Rightarrow 2r^x = r^{2x} - r$$

$$\Rightarrow 2r^x = r^{2x} - r$$

$$\Rightarrow r = \frac{r^{2x} - r}{r^x} = 1 + \frac{r^x - r}{r^x} \Rightarrow r = \frac{r^x - r}{r^x} \Rightarrow x = 2$$

$$\Rightarrow r^{2x} - r + r^{x+1} + r^x - 1 = r^x - r + r^x + r^x - 1 = 12 + 12 + 3 = 27$$

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$$d_{12} - d_1 = 7d = 0 \Rightarrow d = 0/7$$

$$d_1 + d_{12} = r d_1 + r \cdot d = r \omega \Rightarrow r d_1 + r \omega = r \omega \Rightarrow r d_1 = -r \omega$$

$$\Rightarrow d_1 = -\omega$$

$$\left\{ \begin{array}{l} d_n = -\omega + (n-1)r/\omega \\ \Rightarrow d_1 = -\omega \end{array} \right.$$

$$\frac{r \times r/\omega}{\omega}$$

$$d_{r1} = -\omega + \left(\frac{r}{\omega}\right) \times r/\omega = \frac{r^2}{\omega}$$

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$$d_t + d_r + d_{rr} + d_{rr} + d_{rr} = \frac{1}{r} (d_t + d_r + d_{rr} + d_{rr} + d_{rr})$$

$$\omega d + 1 - d = \frac{1}{r} (\omega d + r \omega d)$$

$$\Rightarrow d + r d = \frac{1}{r} (a + v d) \Rightarrow d = \frac{1}{r} d + \frac{1}{r} d - r d = \frac{1}{r} d + \frac{1}{r} d = \frac{1}{r} (a + d)$$

$$\Rightarrow d = \frac{1}{r} \underbrace{(a + d)}_{a_r} \Rightarrow \frac{a_r}{a_1} = \frac{1}{r}$$

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$$t_n = t_{n-r} + 1\omega$$

$$t_r = t_1 + 1\omega$$

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$$t_1 + r d = t_1 + 1\omega \Rightarrow r d = 1\omega \Rightarrow d = \omega$$

$$t_9^r - t_0^r = (a + (1 \times \omega))^r - (a + (r \times \omega))^r = a^r + 1 \cdot a + 1 \cdot 9 \cdot \dots - a^r - r \cdot a - r \cdot \dots = r \cdot a + 1 \cdot r \cdot \dots = r \cdot (a + r \cdot \dots)$$

$$\frac{r \cdot (a + r \cdot \dots)}{a + 9(\omega)} = \frac{r \cdot \dots}{\dots}$$

Y

$$\frac{r + \sqrt{r} - r(1 - 9\sqrt{r})}{1r} = \frac{r + \sqrt{r} - r + 1r\sqrt{r}}{1r} = \frac{1r\sqrt{r}}{1r} = 1r = d$$

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$$\frac{r r - r}{r n - r} \times n + r = 11 \Rightarrow \frac{r}{r(n-1)} \times n = 9 \Rightarrow \frac{1 \omega n}{r n - 1} = 9 \Rightarrow 1 \omega n = 1 \lambda n - 9 \Rightarrow r n = 9 \Rightarrow n = r$$

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$$a_n = r \times a_{n-r} \quad a_n + d_{n+r} = a_r + d_{1r} = r d_1 + 1 \lambda d = 19 d$$

$$\Rightarrow d_r = r d_1 \Rightarrow r d_1 = d$$

$$a_n = r d_r$$

$$d_n + d_{n+r} = d_1 + (n-1)d + d_1 + (n+r)d = 19 d$$

$$\left. \begin{array}{l} a_k = d_1 + r d \\ a_n = d_1 + v d \end{array} \right\} \begin{array}{l} a_1 + v d = r(d_1 + r d) = r d_1 + 9 d \\ a_1 + v d = r d_1 + 9 d \end{array}$$

$$\Rightarrow r d_1 + n d - d + n d + r d = 19 d$$

$$\Rightarrow d_r = -r d \Rightarrow d_1 = -d$$

$$\Rightarrow r n d + r d = 19 d \Rightarrow r n d = 18 d \Rightarrow r n = 18 \Rightarrow n = 1$$

$$d_k = a_1 + (k-1)d = -d + (k-1)d = (k-r)d = 0$$

$$\Rightarrow k = r$$

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