

$$\{ \overset{+}{\omega}, \overset{+}{9}, \overset{+}{13}, \overset{+}{17}, \dots \} = \{ \alpha_n = 4n+1 \}$$

$$\alpha_{10} = 4(10) + 1 = 41$$

$$\{ \overset{+}{6}, \overset{+}{10}, \overset{+}{14}, \overset{+}{18}, \dots \} = \{ \alpha_n = 4n+2 \}$$

$$\alpha_{12} = 4(10) + 2 = 42 \Rightarrow S_{12} = \frac{1}{4} (6 + 42) = 5 \times 4 = 20$$

$$\alpha_{14} + \alpha_{16} + \alpha_{18} + \alpha_{20} = 4\alpha_1 + 111d = 4(6) + 111(4) = 454$$

$$\{ \overset{+1-\sqrt{3}}{1+\sqrt{3}}, \overset{+1-\sqrt{3}}{2}, \overset{+1-\sqrt{3}}{3-\sqrt{3}}, \dots \} = \{ \alpha_n = (1-\sqrt{3})n + 2\sqrt{3} \} \Rightarrow \alpha_{12} - \alpha_{13} = (1-\sqrt{3})2\omega + 2\sqrt{3} - ((1-\sqrt{3})2\omega + 2\sqrt{3}) = 0$$

$$2\omega - 2\omega\sqrt{3} + 2\sqrt{3} - 2\omega + 2\omega\sqrt{3} - 2\sqrt{3} = 0$$

$$\{ \overset{+2\omega}{\omega}, \overset{+2\omega}{3\omega}, \overset{+2\omega}{5\omega}, \dots \} = \{ 3\omega + 2\omega = 5\omega \Rightarrow 2\omega(\omega+1) = 5\omega \Rightarrow \omega + 1 = 5 \Rightarrow \omega = 4 \}$$

$$x, y, z \Rightarrow \frac{x+y}{z} = 2 \Rightarrow y = 4-x \Rightarrow y = 4-1 = 3$$

$$2x-5, 2x-1, 2x, \dots \Rightarrow 2x-1 = \frac{2x-5+2x}{2} \Rightarrow 4x-2 = 4x-5 \Rightarrow 3 = 2x \Rightarrow x = \frac{3}{2}$$

$$2(\frac{1}{2})-5, 2(\frac{1}{2})-1, 2(\frac{1}{2}), \dots \Rightarrow -3, -1, 1, 3, \dots = \alpha_n$$

$$\{ \overset{+2}{3}, \overset{+2}{7}, \overset{+2}{11}, \dots \} = \{ \alpha_n = 2n+1 \}, \{ \overset{+3}{2}, \overset{+3}{5}, \overset{+3}{8}, \dots \} = \{ b_n = 3n-1 \} \Rightarrow c_n = 5n-1$$

$$\alpha_{10} = 2(20) + 1 = 41, b_{10} = 3(20) - 1 = 59 \Rightarrow 5n-1 \ll 41 \Rightarrow 5n \ll 42 \Rightarrow n \ll 8.4 \Rightarrow n = 8$$

$$\alpha_1 + \alpha_2 + \alpha_3 = 1 \Rightarrow \alpha_1 + 2d = 1 \Rightarrow 3\alpha_1 + 3(2d) = 1 \Rightarrow 3\alpha_1 - 6 = 1 \Rightarrow \alpha_1 = 2.33 \Rightarrow \alpha_1 = 2$$

$$\alpha_1 + \alpha_2 + \alpha_3 = 10 \Rightarrow \alpha_1 + 2d = 10 \Rightarrow 3\alpha_1 + 3(2d) = 10 \Rightarrow 3\alpha_1 - 6 = 10 \Rightarrow \alpha_1 = 4.66 \Rightarrow \alpha_1 = 4$$

$$-3d = -14 \Rightarrow d = 4.66$$

$$d = 4.66$$

$$\left. \begin{array}{l} \alpha_1 + \alpha_2 + \alpha_3 = 10 \\ \alpha_4 + \alpha_5 = 20 \end{array} \right\} \Rightarrow \left\{ \begin{array}{l} 3\alpha_1 + 3d = 10 \Rightarrow \alpha_1 + d = 3.33 \Rightarrow \alpha_1 + 3 = 3.33 \Rightarrow \alpha_1 = 0.33 \\ 4\alpha_1 + 4d = 20 \Rightarrow \alpha_1 + d = 5 \end{array} \right\} \Rightarrow \alpha_1 = 1 + (1-1) = 1$$

$$-10d = -14 \Rightarrow d = 1.4$$

$$S_9 = 9S_3 \Rightarrow \frac{9}{4} (2\alpha_1 + 11d) = 9 \left(\frac{9}{4} (2\alpha_1 + 2d) \right) \Rightarrow 9\alpha_1 + 9d = 9\alpha_1 + 9d \Rightarrow d = 2\alpha_1 \Rightarrow$$

$$\frac{\alpha_{20}}{\alpha_1} = \frac{\alpha_1 + 19(2\alpha_1)}{\alpha_1 + 19(2\alpha_1)} = \frac{39\alpha_1}{39\alpha_1} = 1$$

$$\left. \begin{array}{l} a_1 = 11 \\ a_1 = 13\omega \end{array} \right\} \Rightarrow a_1 + 1d = 13\omega \Rightarrow 11 + 1d = 13\omega \Rightarrow d = 2 \Rightarrow a_n = 2n + 1 \Rightarrow a_5 = 2(5) + 1 = 11 = b_5 \Rightarrow \left. \begin{array}{l} b_5 = 11 \\ b_1 = 13 \end{array} \right\} \Rightarrow -10$$

$$\begin{array}{l} - \left\{ \begin{array}{l} b_1 + 1d = 11 \\ b_1 = 13 \end{array} \right. \\ \hline 1d = -1\omega \Rightarrow \\ d = -\omega \end{array}$$

$$\Rightarrow -\omega = \frac{13 - 11}{n + 1} \Rightarrow -\omega n - \omega = -2 \Rightarrow -\omega n = -1 \Rightarrow n = 1$$