

$$4(viii) -\frac{1}{2}, -\frac{1}{2}, -\frac{1}{2}, -\frac{1}{2}, \dots$$

$$\begin{aligned} a_2 - a_1 &= -\frac{1}{2} - \left(-\frac{1}{2}\right) \\ &= -\frac{1}{2} + \frac{1}{2} \\ &= 0 \end{aligned}$$

$$\begin{aligned} a_3 - a_2 &= -\frac{1}{2} + \frac{1}{2} \\ &= 0 \end{aligned}$$

$$\begin{aligned} a_4 - a_3 &= -\frac{1}{2} + \frac{1}{2} \\ &= 0 \end{aligned}$$

\therefore diff. remains const.

\therefore A.P.

$$4(x) 1, 3, 9, 27, \dots$$

$$\begin{aligned} a_2 - a_1 &= 3 - 1 \\ &= 2 \end{aligned}$$

$$\begin{aligned} a_3 - a_2 &= 9 - 3 \\ &= 6 \end{aligned}$$

$$\therefore a_2 - a_1 \neq a_3 - a_2$$

\therefore not A.P.

$$4(x) a, 2a, 3a, 4a, \dots$$

$$\begin{aligned} a_2 - a_1 &= 2a - a \\ &= a \end{aligned}$$

$$\begin{aligned} a_3 - a_2 &= 3a - 2a \\ &= a \end{aligned}$$

$$\begin{aligned} a_4 - a_3 &= 4a - 3a \\ &= a \end{aligned}$$

\therefore diff const.

\therefore A.P.

$$4(x) a, a^2, a^3, a^4$$

$$\begin{aligned} a_2 - a_1 &= a^2 - a \\ &= a(a-1) \end{aligned}$$

$$\begin{aligned} a_3 - a_2 &= a^3 - a^2 \\ &= a^2(a-1) \end{aligned}$$

$$\therefore a_2 - a_1 \neq a_3 - a_2$$

\therefore not A.P.

$$4(xii) \sqrt{2}, \sqrt{8}, \sqrt{18}, \sqrt{32}, \dots$$

$$= \sqrt{2}, 2\sqrt{2}, 3\sqrt{2}, 4\sqrt{2}, \dots$$

$$\begin{aligned} a_2 - a_1 &= 2\sqrt{2} - \sqrt{2} \\ &= \sqrt{2} \end{aligned}$$

$$\begin{aligned} a_3 - a_2 &= 3\sqrt{2} - 2\sqrt{2} \\ &= \sqrt{2} \end{aligned}$$

$$\begin{aligned} a_4 - a_3 &= 4\sqrt{2} - 3\sqrt{2} \\ &= \sqrt{2} \end{aligned}$$

\therefore diff remains same

\therefore A.P.

$$4(xiii) \sqrt{3}, \sqrt{6}, \sqrt{9}, \sqrt{12}, \dots$$

$$\begin{aligned} a_2 - a_1 &= \sqrt{6} - \sqrt{3} \\ &= \sqrt{3}(\sqrt{2} - 1) \end{aligned}$$

$$\begin{aligned} a_3 - a_2 &= \sqrt{9} - \sqrt{6} \\ &= \sqrt{3}(\sqrt{3} - \sqrt{2}) \end{aligned}$$

$$\therefore a_3 - a_2 \neq a_2 - a_1$$

\therefore AP

$$4(x) 1^2, 3^2, 5^2, 7^2, \dots$$

$$= 1, 9, 25, 49, \dots$$

$$\begin{aligned} a_2 - a_1 &= 9 - 1 \\ &= 8 \end{aligned}$$

$$\begin{aligned} a_3 - a_2 &= 25 - 9 \\ &= 16 \end{aligned}$$

$$\therefore a_3 - a_2 \neq a_2 - a_1, \text{ not AP}$$