

A.P

$$1) \quad a_n = 2n + 1$$
$$a_{n-1} = 2(n-1) + 1$$
$$= 2n - 1$$

$$d = a_n - a_{n-1} = (2n+1) - (2n-1)$$
$$= \underline{\underline{2}} \quad \textcircled{b}$$

$$2) \quad 2, 5, 8, \dots, 59$$

Let no. of terms = n

$$a_n = 59$$

$$d = 5 - 2 = 3$$

$$a = 2$$

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

$$59 = 2 + (n-1)(3)$$

$$\frac{57}{3} = n - 1 \Rightarrow \boxed{n = 20}$$

ⓐ

$$3) \quad -11, -8, -5, \dots$$

First +ve term comes after 0.

So, 1st we need to find the terms ending in 0 or nearest to it.

$$* \quad a_n = 0$$

$$a = -11$$

$$d = -8 - (-11) = 3$$

$$\text{So, } a_n = a + (n-1)d$$

$$0 = -11 + (n-1)3$$

$$11 = 3n - 3$$

$$4 \cdot 6 = \frac{14}{3} = n \quad \longrightarrow \quad a_n = 4 \text{ is the last negative term of sequence}$$

So, 1st (+ve) term = $a_{n=5}$

$$a_{n=5} = a + 4d = -11 + 4(3) = \underline{\underline{1}} \quad \textcircled{a}$$

4) A.P = 2, 5, 8, ..., 35

Reversing A.P. \rightarrow 35, 32, 29, ..., 5, 2
 $\hookrightarrow a = 35$

$$d = 32 - 35 = -3$$

$$n = 4$$

$$\text{So, } a_4 = a + 3d$$

$$= 35 + 3(-3) = 35 - 9 = \underline{\underline{26}}$$

$$5) \begin{array}{l} a_{11} = 35 \\ a + 10d = 35 \quad \text{--- (i)} \end{array} \quad \left/ \quad \begin{array}{l} a_{13} = 41 \\ a + 12d = 41 \quad \text{--- (ii)} \end{array} \right. \begin{array}{l} \textcircled{6} \\ \textcircled{11} \end{array}$$

from (ii) - (i),

$$2d = 6$$

$$\underline{\underline{d = 3}} \quad \textcircled{7}$$

6) A.P = $\sqrt{8}, \sqrt{18}, \sqrt{32}, \dots$
 $= 2\sqrt{2}, 3\sqrt{2}, 4\sqrt{2}$

So next term = $\underline{\underline{5\sqrt{2}}}$ $\textcircled{8}$

7) $a_5 = a_{10} = 5a$

$$\Rightarrow [a + 4d = a + 9d] = 5a$$

$$\Rightarrow \underline{\underline{d = 0}} \rightarrow \underline{\underline{a = 0}}$$

So, $a_{15} = 0 \rightarrow$ A.P is constant A.P.

8) (b) 3, 7, 12, 18 ...
as diff is not const \rightarrow No A.P.

9) 1 + 3 + 5 + 7 + ... 20th term
 $a = 1$
 $d = 2$ ~~$a_n = a + (n-1)d$~~
 $n = 20$ ~~$= 1 + 19 \times 2$~~

$$S_n = \frac{n}{2} [2a + (n-1)d]$$

$$= \frac{20}{2} [2 + 19 \times 2] = 20 [2 + 38] = 400$$

10) $\frac{n(n+1)}{2} = \frac{20(21)}{2} = 210$ (c)