

H.W  
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## Arithmetic progression

$$1) a_1 = 2(1) + 1 \\ = 3$$

$$a_2 = 2(2) + 1 \\ = 5$$

$$d = a_2 - a_1 \\ = 5 - 3 = 2$$

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

$$\Rightarrow 3n = 57 + 3$$

$$\Rightarrow 3n = 60$$

$$\Rightarrow n = 20$$

$$3) a_1 = -11$$

$$a_2 = -8$$

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

$$a_n = -11 + 3(n-1) \\ = 3n - 14$$

$$3n - 14 = 0$$

$$\Rightarrow 3n = 14$$

$$\Rightarrow n = \frac{14}{3} = 4.6 = 5 \text{ (approx.)}$$

1<sup>st</sup> term = 1

4

$$4) a_n = a + (n-1)d$$

$$35 = 2 + (n-1)3$$

$$35 - 2 = 3n - 3$$

$$\Rightarrow 3n = 33 + 3$$

$$\Rightarrow 3n = 36$$

$$\Rightarrow n = 12$$

$$\begin{aligned}
 a_8 &= 2 + (8-1)3 \\
 &= 2 + 7 \times 3 \\
 &= 2 + 21 = 23
 \end{aligned}$$

5)  $a_n = 35$  &  $a_{13} = 41$

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

$$35 = a_{11} = a + 10d \quad \text{--- (1)}$$

$$41 = a_{13} = a + 12d \quad \text{--- (2)}$$

Subtracting equation (1) by (2).

We get

$$6 = 2d$$

$$\Rightarrow d = \frac{6}{2} = 3$$

6)  $\sqrt{8}, \sqrt{18}, \sqrt{32}, \dots$

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

Difference =  $\sqrt{2}$

so, another will be  $5\sqrt{2}$ .

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

$$a + 4d = a + 9d = 5a \quad \text{--- (1)}$$

$$a + 4d = a + 9d$$

$$5d = 0$$

$$\Rightarrow d = 0 \quad \text{--- (2)}$$

$$5a = a + 4d$$

$$5a - a = 4d$$

$$\Rightarrow 4a = 4d$$

$$\Rightarrow a = d = 0$$

$$9, 15 = a + 14d$$

$$= 0 + 14 \times 0$$

$$= 0$$

8) 1, 4, 7, ...

$$d = 4 - 1 = 3$$

$$7 - 4 = 3$$

3, 7, 12, 18, ...

$$d = 7 - 3 = 4$$

$$12 - 7 = 5 \neq 4$$

So, there is no common difference

$\Rightarrow$  It is not an AP.

9) 1, 3, 5, 7, 9, ..., 39

$$a = 1$$

$$S = \frac{n}{2} (2a + (n-1)d)$$

$$d = 2$$

$$n = 20$$

$$= \frac{20}{2} (2 \times 1 + (20-1)2)$$

$$= 400$$

10) 1, 2, 3, ..., 20

$$a = 1$$

$$d = 1$$

$$n = 20$$

$$S = \frac{n}{2} (2a + (n-1)d) = \frac{20}{2} (2 \times 1 + (20-1)1)$$

$$= 10 \times 21 = 210$$