

$$1) a_n = 4n + 15$$

$$a_1 = 4(1) + 15 \\ = 19$$

$$a_2 = -4(2) + 15 \\ = -8 + 15 \\ = 7$$

$$a_3 = -4(3) + 15 \\ = -12 + 15 \\ = 3$$

$$a_4 = -4(4) + 15 \\ = -16 + 15 \\ = -1$$

$$a_2 - a_1 = 7 - 19 = -12$$

$$a_3 - a_2 = 3 - 7 = -4$$

$$a_4 - a_3 = -1 - 3 = -4$$

$$2) a_n = 6n + 11$$

$$a_1 = 6(1) + 11 \\ = 17$$

$$a_2 = 6(2) + 11 \\ = 23$$

$$\text{Common difference} = 23 - 17 = 6$$

(3) nth term AP 9, 7, 5 =  $a + (n-1)d$   
 $\Rightarrow 9 + (n-1)(-2)$

$9 - 2n + 2 = 11 - 2n$   
 nth term AP 15, 12, 9 =  $a + (n-1)d$   
 $15 + (n-1)(-3)$

$15 - 3n + 3 = 18 - 3n$

$11 - 2n = 18 - 3n$

$3n - 2n = 18 - 11$

$n = 7$

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

We have  $a_7 = 31$  and  $a_{10} = 16$

$\Rightarrow a + 7d = 31$  and  $a + 10d = 16$

$\Rightarrow a + 7d = 31$  and  $4d = 16$

$\Rightarrow a + 7d = 31$  and  $d = 4 \Rightarrow a + 7 \times 4 = 31$

$\Rightarrow a + 28 = 31$

$a = 3$

Hence the AP = 3, 7, 11, 15, 19...

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

When  $a$  is 1st term

(d) is common difference.

1, 3.5, 6, 8.5

$d = 3.5 - 1 = 2.5$

$$a = 1$$
$$n = 10$$

$$a_{10} = 1 + (10-1) \cdot 2.5$$
$$= 1 + 9 \times 2.5$$
$$= 23.5$$

$$n(n+1)/2$$

Here  $n = 10$

$$10(10+1)/2$$
$$= 10 \times 11 / 2$$
$$= 5 \times 11$$
$$= 55$$