1. $a_n = -4n+15$ ⟶ gen term

$a_1 = -4(1)+15 = 11$
$a_2 = -4(2)+15 = 7$
$a_3 = -4(3)+15 = 3$
$a_4 = -4(4)+15 = -1$

Sequence of AP: 11, 7, 3, −1, ....

2. $a_n = 6n+11$ ⟶ $n^{th}$ term

d = common diff = $\boxed{a_n - a_{n-1}}$

$a_{n-1} = 6(n-1)+11$
$= 6n-6+11 = 6n+5$

So, $d = (6n+11)-(6n+5) = \underline{6}$

3. A.P$_1$ = 9, 7, 5, .... n terms
$n^{th}$ term = $a_{n_1} = a_1+(n-1)d_1$
$= 9+(n-1)(-2)$
$= 9-2n+2 = \underline{11-2n}$

AP$_2$ = 15, 12, 9, .... n terms
$n^{th}$ term = $a_{n_2} = a_2+(n-1)d_2$
$= 15+(n-1)(-3)$
$= 15-3n+3 = \underline{18-3n}$

A/Q. $a_{n_1} = a_{n_2}$
$11-2n = 18-3n$
$\boxed{n = 7}$

4 $a_8 = a + 7d = 31$ ——— (1)

$a_{15} = a + 14d = 16 + a_{11} = 16 + a + 10d$

So, $a + 14d = 16 + a + 10d$

$\Rightarrow 4d = 16$

$\Rightarrow \boxed{d = 4}$

Putting in (1), $a + 7(4) = 31$

$\boxed{a = 3}$

AP = $a, a+d, a+2d, a+3d, \ldots$

= 3, 7, 11, 15, ...

5. AP = 1, 3.5, 6, 8.5, ...

$d = 3.5 - 1 = 6 - 3.5 = 2.5$

$a = 1$

$a_{10} = a + 9d$

$= 1 + 9(2.5) = 22.5 + 1 = 23.5$

6 Sum of 1st 10 Natural nos. -

$1 + 2 + 3 + \ldots + 9 + 10$

$= \frac{n(n+1)}{2} = \frac{10(10+1)}{2} = \frac{10 \times 11}{2} = 55$