EXERCISE - 5.2

(1)

	a	d	n	a_n
(i)	7	3	8	28
(ii)	-18	2	10	0
(iii)	46	-3	18	-5
(iv)	-18.9	2.5	10	3.6
(v)	3.5	0	105	3.5

(2) (i) $a_n = a + 29d$, $10 + 29 \times (-3) = -77$

$a = 10$

$d = a_2 - a_1 = 7 - 10 = (-3)$; $n = 30$

$a_n = a + 29d$

$= 10 + 29 \times (-3)$

$= 10 + (-87)$

$= -77$

So, the 30th term of AP is (C) -77.

(ii) AP $\Rightarrow -3, \frac{-1}{2}, 2 \ldots\ldots$

$a = -3$

$d = a_2 - a_1 = \frac{-1}{2} - (-3) = -\frac{1}{2} + 3 \times 3 = \frac{5}{2}$;

$a_3 - a_2 = 2 + \frac{1}{2} = \frac{5}{2}$

$n = 11$

$a_n = ?$

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

$a_n = -3 + (11-1)\frac{5}{2}$

$= -3 + 10 \times \frac{5}{2}$

$= -3 + 25$

$= 22.$

So, the 11th term of AP is (B) 22.

(3) (i) 2, $\boxed{14}$, 26

$a = 2,$

$a_n = 26, \; n = 3, \; d = ?$

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

$\Rightarrow 26 = 2 + (3-1)d$

$\Rightarrow 26 = 2 + 2d$

$\Rightarrow 26 - 2 = 2d$

$\Rightarrow \frac{24}{2} = d$

$\Rightarrow d = 12.$

So, 2nd term will be.

$a + d$

$2 + 12 = 14$

(ii) $\boxed{18}, 13, \boxed{8}, 3$

$a_n = 3,$

$a = 13, \quad d = ?$

$n = 3$

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

$3 = 13 + (3-1)d$

$3 - 13 = 2d$

$d = \frac{(-10)}{2} = (-5)$

So, the first term would be

$13 + 5 = 18,$ &

3rd term - $13 - 5$

$= 8$

(iii) $5, \boxed{\frac{13}{2}}, \boxed{8}, \frac{19}{2}$

$a = 5, \quad a_n = \frac{19}{2}, \quad n = 4, \quad d = ?$

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

$\Rightarrow \frac{19}{2} = 5 + (4-1)d \Rightarrow \frac{19}{2} - \frac{5 \times 2}{2} = 3d$

$\Rightarrow \frac{9}{2} \times \frac{1}{3} = d \quad$ So, $d = \frac{3}{2}.$

The 2nd term $\Rightarrow \frac{2\times5}{3} + \frac{3}{2} = \frac{13}{2}$

The 3rd term $\Rightarrow \frac{13}{2} + \frac{3}{2} = \frac{16}{2} = 8$

(iv) $-4, \boxed{-2}, \boxed{0}, \boxed{2}, \boxed{4}, 6$

$a_n = 6$

$a = (-4), n = 6, d = ?$

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

$\Rightarrow 6 = (-4) + (6-1)d$

$\Rightarrow 6+4 = 5d$

$\Rightarrow 10 = 5d$

$\Rightarrow d = \frac{10}{5} = 2$

Thus, the other 4 terms are -

2nd: $-4+2 = (-2)$

3rd: $-2+2 = 0$

4th: $0+2 = 2$

5th: $2+2 = 4$

(v) $\boxed{53}, 38, \boxed{23}, \boxed{8}, \boxed{-7}, -22$

$a_n = (-22), a = 38, n = 5, d = ?$

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

$\Rightarrow -22 = 38 + (5-1)d$

$\Rightarrow -22 - 38 = 4d$

$\Rightarrow -60 = 4d \Rightarrow d = \frac{-60}{4} = (-15)$

The 1st term, - 38 + 15 = 53

3rd term - 38 + 2(-15) = 23

4th term - 23 + (-15) = 8

5th term = 8 + (-15) = (-7)

(4) The term of AP which is 78 is -

AP = 3, 8, 13, 18 ... 78

a = 3, d = 8 - 3 = 5, a_n = 78, n = ?

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

$78 = 3 + (n-1)5$

$78 - 3 = (n-1)5$

$\frac{75}{5} = n - 1$

$n = 15 + 1$

$n = 16$

So, the term of A.P. which is 78 is the 16th term.

(5) (i) Given - AP - 7, 13, 19 205

a_n = 205, a = 7, d = 13 - 7 = 6, n = ?

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

$205 = 7 + (n-1)6$

$\Rightarrow 205 - 7 = (n-1)\,6$

$\Rightarrow \frac{198}{6} = (n-1)$

$\Rightarrow n = 33 + 1$

$\Rightarrow n = 34$

So, the given AP has 34 terms.

(ii) $18, 15\frac{1}{2}, 13 \ldots\ldots, -47$

$18, \frac{31}{2}, 13 \ldots\ldots, -47.$

Here, $a = 18$, $a_n = (-47)$, $d = \frac{31}{2} - \frac{18 \times 3}{2}$

$= \frac{31 - 36}{2} = \left(\frac{-5}{2}\right)$

using formula,

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

$\Rightarrow -47 = 18 + (n-1)\frac{-5}{2}$

$\Rightarrow -47 - 18 = (n-1)\frac{-5}{2}$

$\Rightarrow -65 \times \frac{2}{-5} = (n-1)$ (13)

$\Rightarrow n = 26 + 1$

$\Rightarrow n = 27$

So, the given AP has 27 terms.

(6) AP $- 11, 8, 5, 2 \ldots$

$a = 11$, $d = 8 - 11 = (-3)$, $a_n = (-150)$, $n = ?$