H.W.

Ex 5.2

Q1) (i) $a = 7$

$d = 3$

$n = 8$

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

$a_8 = 7 + (8-1)3 = 7 + 21 = 28$

(ii) $a = -18$

$n = 10$

$a_n = 0$

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

$\Rightarrow 0 = -18 + (10-1)d$

$\Rightarrow 0 = -18 + 9d$

$d = 2$

(iii) $d = -3$

$n = 18$

$a_n = -3$

$\therefore a_n = a + (n-1)$

$\Rightarrow -5 = a + (18-1)-3$

$\Rightarrow a = 46$

(iv) $a = -18.9$

$d = 2.5$

$a_n = 3.6$

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

$3.6 = -18.9 + (n-1)2$

$\Rightarrow 25 = 2.5n$

$\Rightarrow n = \frac{25}{2.5} = 10$

(v) $a = 3.5$.
$d = 0$.
$n = 105$.
$\therefore a_n = a + (n-1)d$
$= 3.5 + (105-1)0 = 3.5$.

Q2.) (i) $10, 7, 4, \ldots$
$a = 10$
$d = 7 - 10 = -3$
$n = 30$.
$a_n = a + (n-1)d$.
$\Rightarrow a_{30} = a + (30-1)d = d + 29d = 10 + 29(-3)$
$= 10 - 87 = -77$.

(ii) $-3, -\frac{1}{2}, 2, \ldots$
$a = -3$
$n = 11$.
$d = -\frac{1}{2} - (-3)$
$= \frac{-1}{2} + \frac{3}{1} = \frac{5}{2}$

$a_n = a + (n-1)d \Rightarrow a_{11} = a + (11-1)d$.
$\Rightarrow a_{11} = a + 10d$
$= -3 + 10 \times \frac{5}{2} = -3 + 25 = 22$

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Q3) (i) $a = 2$
$t_3 = 26$
$t_3 = a + (3-1)d$

$\Rightarrow 26 = 2 + 2d$
$\Rightarrow d = 12$
$\therefore t_2 = t_3 - d = 26 - 12$
$= 14.$
$\therefore$ the compelete sequence is 2, $\boxed{14}$, 26.

(ii) $t_2 = 13.$
$t_4 = 3.$
$t_2 = a + (2-1)d.$

$\Rightarrow 13 = a + d \quad \cdots (i)$
$t_4 = a + (4-1)d$
$\Rightarrow 3 = a + 3d \quad \cdots (ii)$
$d = -5$
$d = -5$

(iii) $a = 5.$
$t_4 = 9\frac{1}{2} = \frac{19}{2}$
then, $t_4 = a + (4-1)d.$
$= \frac{19}{2} - \frac{3}{2} = \frac{16}{2} = 8.$

& $t_2 = t_3 - d.$
$= 8 - \frac{3}{2} = \frac{16-3}{2} = \frac{13}{2} = 6\frac{1}{2}$

Hence, the compelete Sequence is 5, $\boxed{6\frac{1}{2}}$, $\boxed{8}$, $9\frac{1}{2}$.

(iv) $a = -4.$
$t_6 = 6.$
then, $t_6 = a + ($

$\Rightarrow 6_4 = -4 + 5$
$\therefore t_2 = a + d$
$t_3 = a + 2$
$t_4 = a + 3$
$t_5 = a + 4$

$\therefore -4, [2$

Q4) given: 3
$a = 3.$
$d = 8 - 3$
Let term
$a_n = 78$
$a + (n$
$\Rightarrow 3 + (n$
$\Rightarrow (n-$
$\Rightarrow (n$
$\Rightarrow n-$
$\Rightarrow n$
$\Rightarrow n$

(iv) $a = -4$.

$t_6 = 6$.

then, $t_6 = a + (6-1)d$.

$\Rightarrow 6 = -4 + 5d \Rightarrow d = 2$.

$\therefore t_2 = a + d = -4 + 2 = -2$.

$t_3 = a + 2d = -4 + 4 = 0$.

$t_4 = a + 3d = -4 + 6 = 2$.

$t_5 = a + 4d = -4 + 8 = 4$.

$\therefore -4, \boxed{-2}, \boxed{0}, \boxed{2}, \boxed{4}, 6$.

Q4.) given: $3, a, 13, 18, \ldots$

$a = 3$.

$d = 8 - 3 = 5$

Let term is 78.

$a_n = 78$

$a + (n-1)d = 78$.

$\Rightarrow 3 + (n-1)5 = 78$.

$\Rightarrow (n-1)5 = 78 - 3$.

$\Rightarrow (n-1)5 = 75$.

$\Rightarrow n - 1 = 15$

$\Rightarrow n = 15 + 1$.

$\Rightarrow n = 16$.

Q5.) (i) $a = 7$.

$d = 13 - 7 = 6$.

$l = 205$

$l = a + (n-1)d$,

$205 = 7 + (n-1) \times 6$.

$\Rightarrow (n-1) = \frac{198}{6} = 33$

$\Rightarrow n = 33 + 1 = 34$.

∴ Hence, the no. of terms in this AP is 34.

(ii) $d = 15\frac{1}{2} - 18 = \frac{31 - 36}{2} = \frac{-5}{2}$.

$l = -47$.

$l = a + (n-1)d$, we get:

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

$\Rightarrow (n-1) = \frac{65 \times 2}{5} = 26$.

$\Rightarrow n = 26 + 1 = 27$.

∴ hence, the no. of terms in AP is 27.

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