5.2 Exercise

Q1) (i) Here, $a = 7$, $d = 3$ and $n = 8$

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

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

(ii) Here, $a = -18$, $n = 10$ and $a_n = 0$.

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

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

$\Rightarrow 0 = -18 + 9d.$

$\Rightarrow d = 2.$

(iii) Here, $d = -3, n = 18$ and $a_n = -5$.

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

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

$\Rightarrow a = 46.$

(iv) Here, $a = -18.9$, $d = 2.5$ and $a_n = 3.6$.

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

$3.6 = -18.9 + (n-1)2.5.$

$\Rightarrow 25 = 2.5n.$

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

(v) Here, $a = 3.5$, $d = 0$ and $n = 105$.

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

$= 3.5 + (105-1)0 = 3.5.$

Q2) (i) (c) -77

(ii) (B) 22.

Q3) (i) Here, $a = 2$ and $t_3 = 26$.

Then, $t_3 = a + (3-1)d$.

$\Rightarrow 26 = a + 2d \Rightarrow d = 12$.

$\therefore t_2 = t_3 - d = 26 - 12 = 14$.

(ii) Here, $t_2 = 13$ and $t_4 = 3$.

Then $t_2 = a + (2-1)d$.

$\Rightarrow 13 = a + d$. .... (i)

and $t_4 = a + (4-1)d$

$\Rightarrow 3 = a + 3d$. ..... (ii).

Subtracting eqn (i) from equation (ii), we get : $d = -5$.

Putting $d = -5$ in equation (i), we get :

$a = 13 + 5 = 18$

$\therefore t_3 = a + (3-1)d$.

$= 18 + 2 \times (-5) = 18 - 10 = 8$.

Q4) Given 3, 8, 13, 18, ...,

$a = 3$

$d = 8 - 3 = 5$.

Let n^{th} term is 78.

$a_n = 78$.

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

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

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

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

$\Rightarrow n - 1 = \frac{75}{5} = 15$.

$\Rightarrow n = 15 + 1$

$\Rightarrow n = 16$.

Hence, $a_{16} = 78$.

Q5) (i)

Q5) (i) Here $a = 7$, $d = 13-7 = 6$ and $l = 205$

Applying the formula $l = a + (n-1)d$, we get,

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

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

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