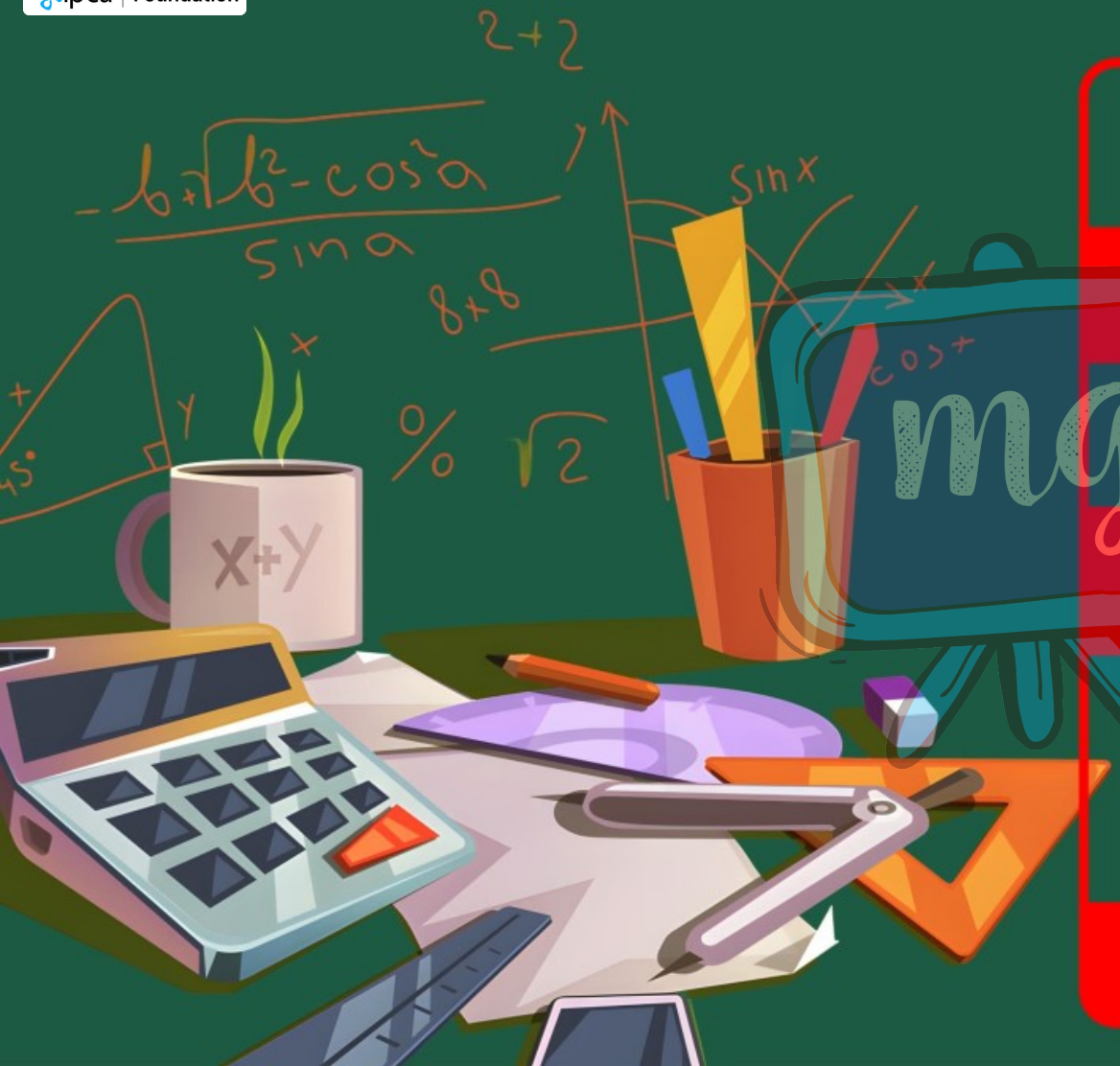
Under CSR Support by ipca | Foundation

missiongyan



CLASS – 10

MATHEMATICS

Chapter – 5

Arithmetic Progressions

Part – 5

EXERCISE 5.2 (Q.1 – 3)

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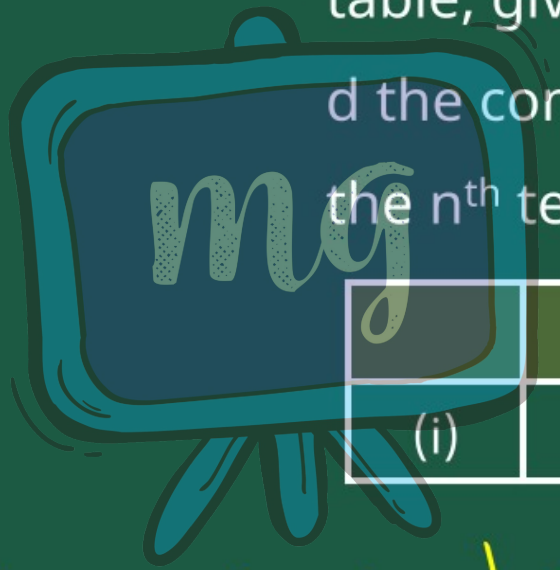
EXERCISE 5.2

1. Fill in the blanks in the following table, given that a is the first term, d the common difference and a_n the n^{th} term of the AP:

	a	d	n	a_n
(i)	7	3	8	28



Solu

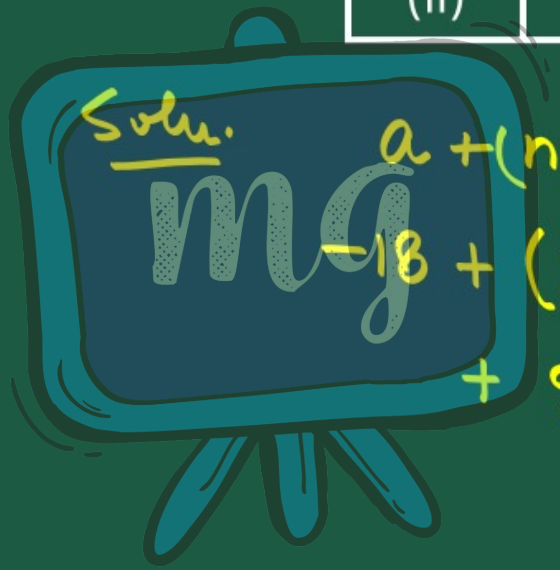
$a_n = a + (n-1)d$

$= 7 + (8-1)3$

$7 + 7 \times 3$

$7 + 21 = 28$

	a	d	n	a_n
(ii)	−18	..2..	10	0



Solu.

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

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

$+ \quad 9 \times d = 0 + 18$

$9d = 18$

$d = 18/9 = 2$

$\boxed{d = 2}$

	a	d	n	a_n
(iii)	46	−3	18	−5

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

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

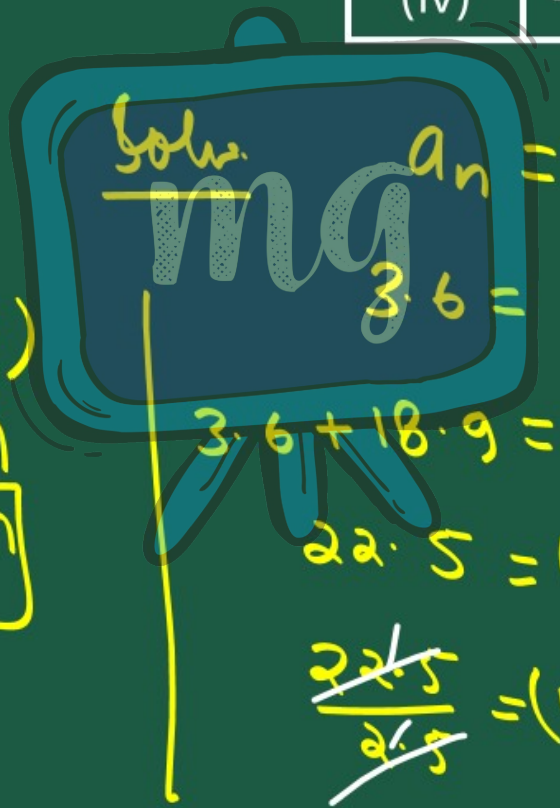
$-5 = a + 17 \times -3$

$-5 = a + (-51)$

$51 - 5 = a$

$46 = a$

	a	d	n	a_n
(iv)	−18.9	2.5	...10...	3.6



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

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

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

$22.5 = (n-1)(2.5)$

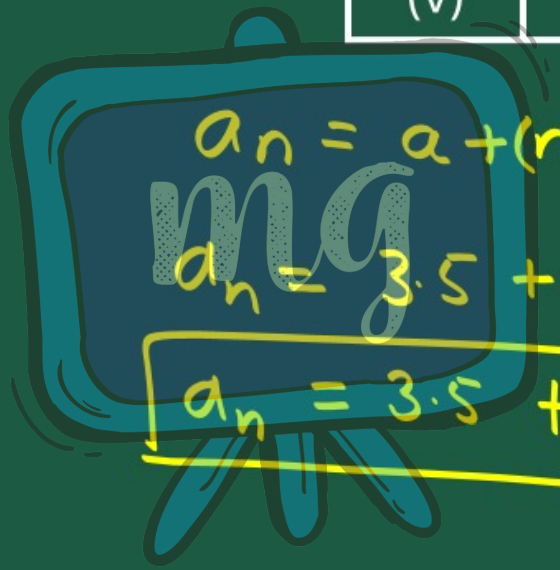
$\frac{22.5}{2.5} = (n-1)$

$9 = (n-1)$

$9+1 = n$

$10 = n$

	a	d	n	a_n
(v)	3.5	0	105	3.5.....



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

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

$a_n = 3.5 + 0$

2. Choose the correct choice in the following and justify :

(i) 30th term of the AP: 10, 7, 4, ..., is

A. 97

B. 77

C. -77

D. – 87

Solu.

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

$a_{30} = 10 + (30-1)(-3)$

$a_{30} = 10 + 29 \times -3$

$= 10 - 87$

$a_{30} = -77$

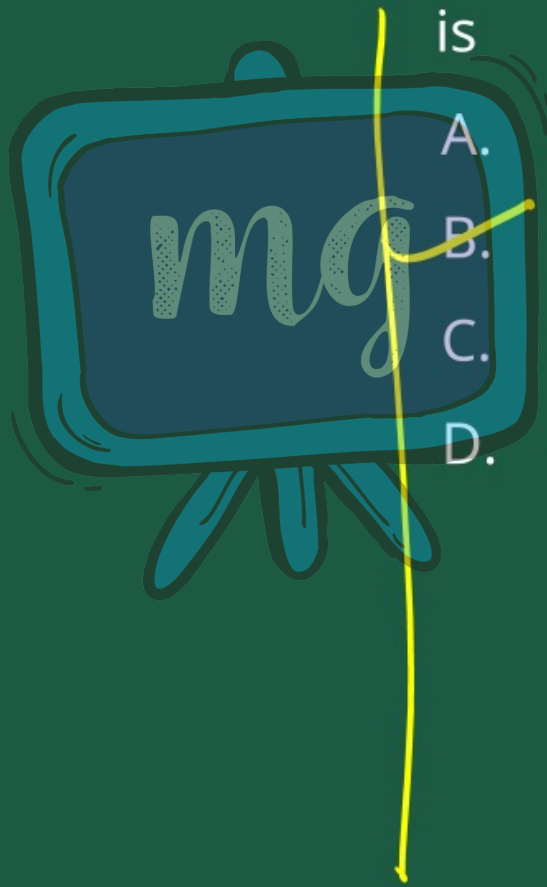
$a = 10$

$d = a_2 - a_1$

$= 7 - 10$

$d = -3$

(ii) 11th term of the AP: $-3, -\frac{1}{2}, 2, \ldots\ldots$ is



A. 28

B. 22

C. -38

D. $-48\frac{1}{2}$

$$a_{11} = a + 10d$$

$a = -3$, $d = a_2 - a_1$

$d = -\frac{1}{2} - (-3)$

$d = -\frac{1}{2} + 3$

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

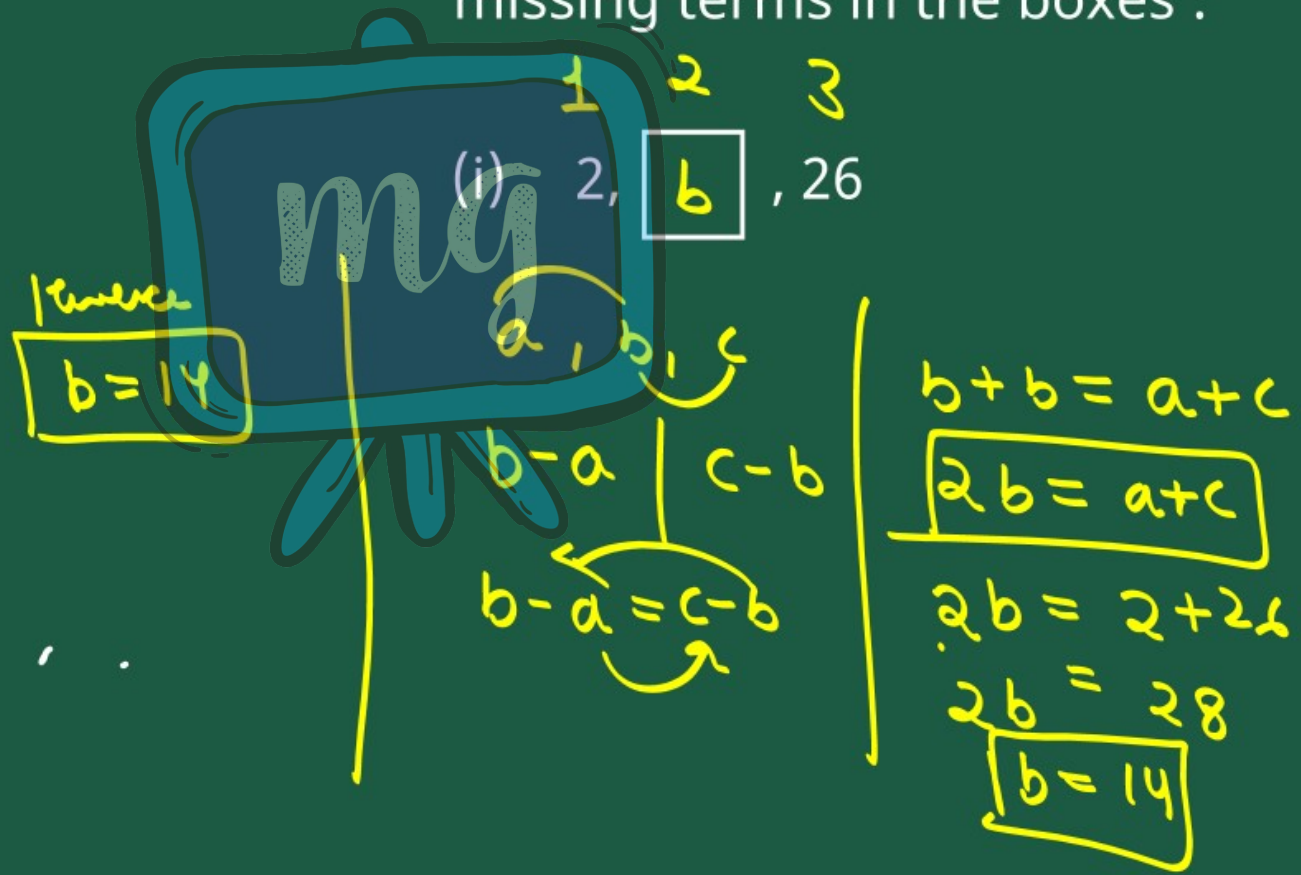
$a_{11} = -3 + 10 \times \frac{5}{2}$

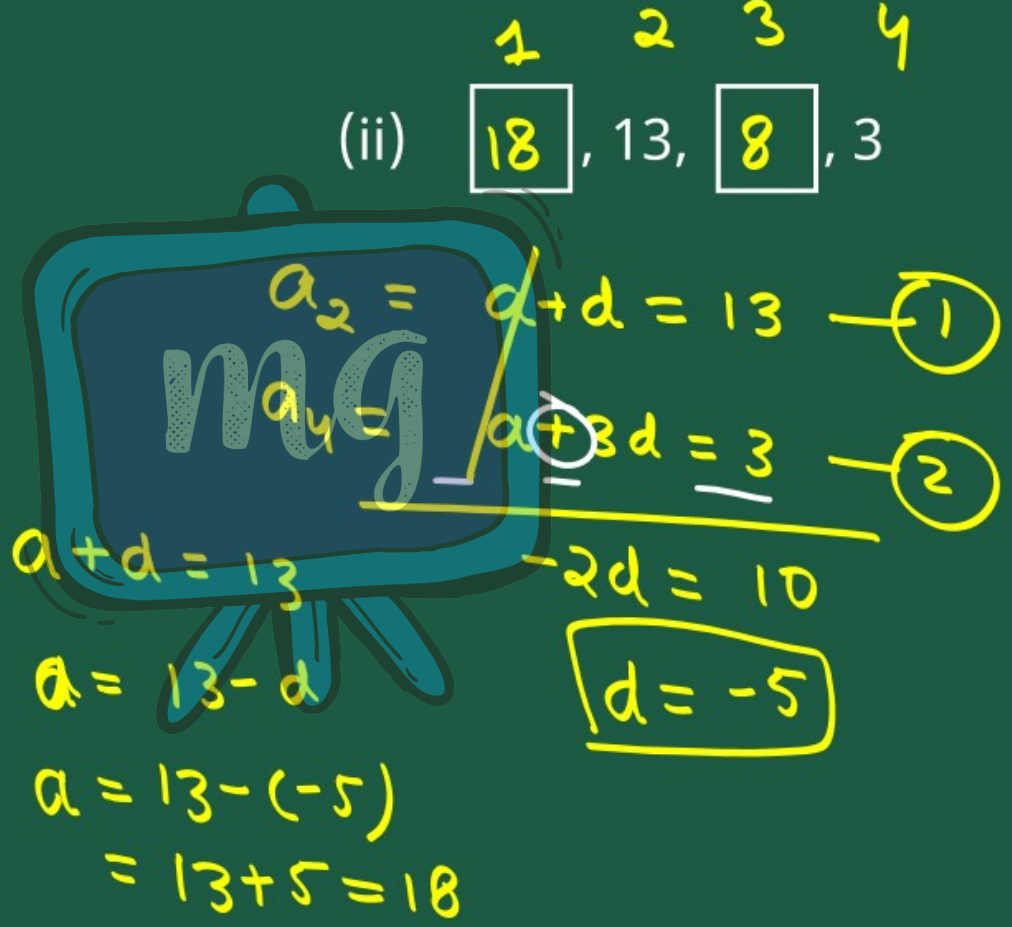
$a_{11} = -3 + 25$

$a_{11} = 22$

3. In the following APs, find the missing terms in the boxes :

(i) 2, [b] , 26





1 2 3 4

(iii) $5, \boxed{13\frac{1}{2}}, \boxed{8}, 9\frac{1}{2}$

$3 \longrightarrow 4.5$

$1 \longrightarrow 1.5$

$3d = 9$

$d = 3$

$a_1 = a = 5$

$a_4 = a + 3d = 19$

$= 5 + 3d = 19$

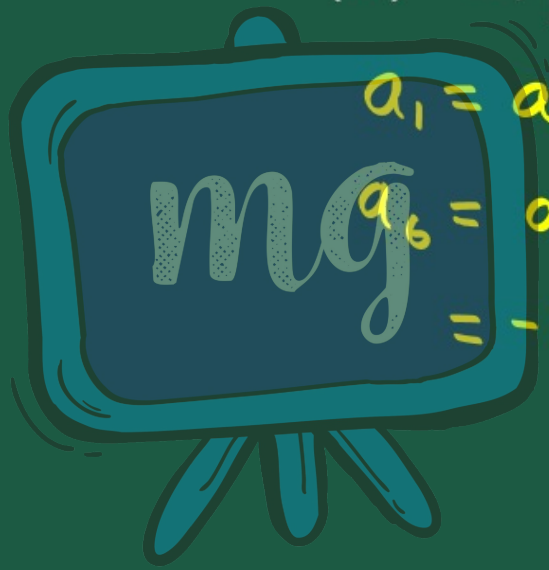
$3d = 19 - 5 = 9$

$13 + 3 = 16$

$= 8$

1 2 3 4 5 6

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



$a_1 = a = -4$

$a_6 = a + 5d = 6$

$= -4 + 5d = 6$

$5d = 10$

$\boxed{d = 2}$

(v) 53, 38, 23, 8, -7, -22

Solu.

$a_2 = 38 \quad | \quad a_6 = -22$

$a + d = 38$

$a + 5d = -22$

$-4d = 60$

$d = -15$

$a + d = 38$

$a - 15 = 38$

$a = 38 + 15$

$a = 53$