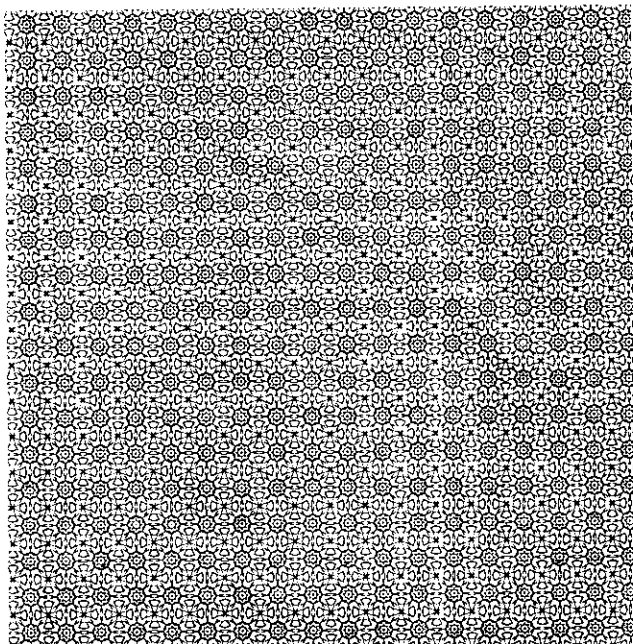


2021 Mathematics Level-1 (E) – 0

712256

Subject Code	S-2021	
Subject	MATHEMATICS LEVEL 1	
Date	11/03/2025	
Supplements attached		
Main Answer Book	No. of supplements	Total
1	+ 3	= 04
Specific remarks of centre conductor regarding malpractices (in Red Ink)		

- Mobile Phones and other electronic gadgets are strictly prohibited inside the examination hall.
- Use of non-programmable calculators is allowed ONLY in some subjects.
- Writing in any form on the Hollow craft sticker and Bar code sticker is strictly prohibited.
- Only blue ink/ball pen is to be used for writing the answers. Black lead pencil may be used for drawing figures, diagrams and graphs. Use of any other Colour pencil/pen is strictly prohibited..
- Disclosing of identity on the answer book (except in the space provided) in any form is strictly prohibited.
- Candidate should check that the printed seat number is correct and verify that the answer book has all pages serially numbered before filling all other details.



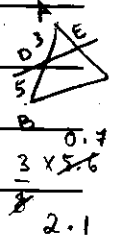
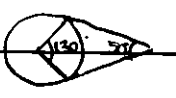
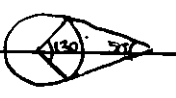
Pg No	Examiner	Moderator	Chief Moderator
03	15.0	15.0	
04 & 05	4.0	4.0	
06 & 07	5.0	5.0	
08 & 09	2.0	2.0	
10 & 11	6.0	6.0	
12 & 13	4.0	4.0	
14 & 15	5.0	5.0	
16 & 17	7.0	7.0	
18	—	—	
Sup. 1	9.0	9.0	
Sup. 2	12.0	12.0	
Sup. 3	10.5	10.5	
Sup. 4	—	—	
Sup. 5	—	—	
Sup. 6	—	—	
TOTAL	79.5	79.5	
Total in words	seventy nine point five	Seventy nine pt five	

Marks Pg. 03	E	M	CM
	15.0	15.0	

03

Q. No.

SECTION - A

1.	7 6	4 9 16 25 36 49 64 81 100 $6x^2 - 3 = 0$ $6x^2 = 3$ $x^2 = \frac{3}{6}$ $x = \frac{1}{\sqrt{2}}$
2.	$\frac{-1}{\sqrt{2}}, \frac{1}{\sqrt{2}}$	$\frac{9}{100} \cdot \frac{1}{2} \times \frac{3}{-3}$ $0.09 F - 3 = x$ $E - 3 = y$ $F = x + 3$ $S = y + 3$ $F + 5 = x + 8$ $S + 5 = y + 8$
3.	unique solution	
4.	$x + y + 16$	4 16 $x + y + 16$
5.	4	
6.	2.1 cm	0.4 3×5.6 2.1
7.	0	$101 - 2 \cdot 5.6$ $= 99 + 1 - 2 \cdot 1$ $= 100 - 3.5$ 2.4 100 3.5 5
8.	0	$\tan \theta + \cot \theta = 2$ $\tan^2 \theta + \cot^2 \theta + 2 = 4$ $= 2$
9.	2	
10.	50°	
11.	$9\pi \text{ cm}^2$	$\pi \times 9$
12.	$R_1^2 + R_2^2 = R^2$	$\pi(R_1^2 + R_2^2) = \pi R^2$ $R_1^2 + R_2^2 = R^2$
13.	9 m^2	$4 \times 1.5 \times 1.5$ 4×9 4
14.	462 cm^2	$r = 7 \text{ cm}$ $3 \times 22 \times 49$ 154 3 462
15.	0.09	

Q. No.

16.

2

17.

$$2x + ky = 1$$

$$2x + ky - 1 = 0$$

Here $a_1 = 2$

$$b_1 = k$$

$$c_1 = -1$$

$$3x - 5y = 7$$

$$3x - 5y - 7 = 0$$

Here $a_2 = 3$

$$b_2 = -5$$

$$c_2 = -7$$

By condition for no solution for a pair of linear equations in two variables

$$a_1 = b_1 \neq c_1$$

$$a_2 \quad b_2 \quad c_2$$

$$\frac{2}{3} = \frac{k}{-5} \neq \frac{-1}{-7}$$

$$3 = -5k$$

So, $\frac{2}{3} = \frac{k}{-5}$

$$-10 = 3k$$

$$k = \frac{-10}{3}$$

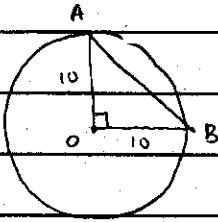
$\therefore$ The value of k is $k = \frac{-10}{3}$

Marks Pg. 04 & 05	E	M	CM
	4.0	4.0	

05

Q. No.

18.



Given: Let a circle with centre O and radius 10 cm have a chord AB subtend an angle of 90° at the centre O

In $\triangle AOB$,

$$AO = OB = 10 \text{ cm [Radii of same circle]}$$

$$\angle AOB = 90^\circ \text{ [Given]}$$

By Pythagoras theorem,

$$(AO)^2 + (BO)^2 = (AB)^2$$

$$10^2 + 10^2 = (AB)^2$$

$$100 + 100 = (AB)^2$$

$$200 = (AB)^2$$

$$AB = \sqrt{200}$$

$$AB = \sqrt{2 \times 100}$$

$$AB = \sqrt{100} \times \sqrt{2}$$

$$AB = 10\sqrt{2} \text{ cm}$$

$\therefore$ The length of AB is $10\sqrt{2} \text{ cm}$.

19. Given: Diameter of circle (d) = 7 cm

$$\text{Radius of circle (r)} = \frac{d}{2} = \frac{7}{2} \text{ cm}$$

$$\text{Area of quadrant of circle} = \frac{1}{4} \pi r^2$$

$$= \frac{1}{4} \times \pi \times \frac{7}{2} \times \frac{7}{2}$$

$$= \frac{49\pi}{16} \text{ cm}^2$$

$\therefore$ The area of the quadrant of the circle is $\frac{49\pi}{16} \text{ cm}^2$

Q. No.

20. Favourable outcomes = $(1, 1), (2, 2), (3, 3)$
 $(4, 4), (5, 5), (6, 6)$

No. of favourable outcomes = 6

Total no. of outcomes = 36

$P(\text{getting same number on both dice}) = \frac{\text{No. of favourable outcomes}}{\text{Total no. of outcomes}}$

$$= \frac{6}{36}$$

$$= \frac{1}{6}$$

$\therefore$ The probability of getting the same number on both dice is $\frac{1}{6}$.

fb

Marks Pg. 06 & 07	E	M	CM
	5.0	5.0	

07

Q. No.

SECTION B

21.	2	112	2	84
	2	56	2	42
2	2	28	3	21
	2	14	7	7
	7	7		1
		1		

Prime factorization of 112 = $2^4 \times 7$

Prime factorization of 84 = $2^2 \times 3 \times 7$

$$\begin{aligned} \text{HCF of 112 and 84} &= 2^2 \times 7 \\ &= 4 \times 7 \\ &= 28 \end{aligned}$$

$\therefore$ The HCF of 112 and 84 is 28

22. Given : $BP \perp OA$

$$\angle BOA = 45^\circ$$

$$BP = 6 \text{ cm}$$

BP and OP are the height and base of $\triangle BOP$ respectively.

$OA = OB = OC$ [Radii of quadrant O-ABC]

In $\triangle OPB$,

$$\angle OPB = 90^\circ \text{ [} BP \perp OA \text{]}$$

$$\angle BOP = 45^\circ \text{ [Given]}$$

$$\sin(\angle BOP) = \frac{\text{opp}}{\text{hyp}} = \frac{BP}{OB}$$

$$\sin 45^\circ = \frac{6}{OB}$$

$$\frac{1}{\sqrt{2}} = \frac{6}{OB}$$

Q. No.

$$OB = 6\sqrt{2} \text{ cm}$$

$\therefore$ The radius of the ~~quadrant~~ quadrant is $6\sqrt{2} \text{ cm}$

Also, ~~and~~

$$\tan(\angle BOP) = \frac{\text{opp}}{\text{adj}}$$

$$\tan 45^\circ = \frac{BP}{OP}$$

$$1 = \frac{6}{OP}$$

$$OP = 6 \text{ cm}$$

$\therefore$ The base of $\triangle BOP$ is 6 cm

Area of shaded region = Area of quadrant O-ABC
- Area of triangle $\triangle BOP$

$$= \frac{1}{4} \times \pi \times (OB)^2 - \frac{1}{2} \times (OP)(BP)$$

$$= \frac{1}{4} \times \pi \times (6\sqrt{2})^2 - \frac{1}{2} \times 6 \times 6$$

$$= \frac{1}{4} \times \pi \times 72 - \frac{1}{2} \times 36$$

$$= 18\pi - 18$$

$$= 18(\pi - 1)$$

$$= 18(3.14 - 1)$$

$$= 18 \times 2.14$$

$$= 38.52 \text{ cm}^2$$

$$\begin{array}{r} 18 \\ 214 \\ \hline 3852 \end{array}$$

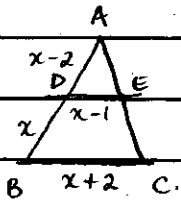
$\therefore$ The area of the shaded region is 38.52 cm^2 .

Marks Pg. 08 & 09	E	M	CM
	2.0	2.0	

09

Q. No.

23.



Given: A triangle ABC with points D and E on sides AB and AC respectively
 $DE \parallel BC$

$$AD = (x-2) \text{ cm}$$

$$AB = x \text{ cm}$$

$$DE = (x-1) \text{ cm}$$

$$BC = (x+2) \text{ cm}$$

In $\triangle ADE$ and $\triangle ABC$,

$\angle ADE = \angle ABC$ [$DE \parallel BC$, AB is a transversal
 Corresponding angles]

$$\angle DAE = \angle BAC \text{ [Common angle]}$$

$\therefore \triangle ADE \sim \triangle ABC$ [AA similarity test]

$$\therefore \frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC} \text{ [Ratios of corresponding sides of similar triangles are equal]}$$

$$\frac{AD}{AB} = \frac{DE}{BC}$$

$$\frac{(x-2)}{(x)} = \frac{(x-1)}{(x+2)}$$

$$(x-2)(x+2) = (x)(x-1)$$

$$x^2 - 4 = x^2 - x$$

$$+4 = +x$$

$$x = 4$$

$\therefore$ The value of x is 4.

Q. No.

24.

Given: $A(x_1, y_1) = (5, -2)$

$B(x_2, y_2) = (-3, 2)$

2

To find a point M on the y axis equidistant to A and B .

Let the required point M ~~be~~ be $(0, y)$.

By condition we have

distance of A to M = distance of B to M

$$\sqrt{(x_1 - 0)^2 + (y_1 - y)^2} = \sqrt{(x_2 - 0)^2 + (y_2 - y)^2}$$

Squaring both sides and substituting known values we get,

$$(5 - 0)^2 + (-2 - y)^2 = (-3 - 0)^2 + (2 - y)^2$$

$$5^2 + (-2 - y)^2 = (-3)^2 + (2 - y)^2$$

$$25 + (-2 - y)^2 = 9 + (2 - y)^2$$

$$25 - 9 = (2 - y)^2 - (-2 - y)^2$$

$$16 = (4 + y^2 - 4y) - (4 + y^2 + 4y)$$

$$16 = 4 + y^2 - 4y - 4 - y^2 - 4y$$

$$16 = -8y$$

$$y = \frac{16}{-8} = -2$$

$\therefore$ The coordinates of the required point M are $(0, -2)$

Marks Pg. 10 & 11	E	M	CM
	6.0	6.0	

Q. No.

25. Given: ~~triangle~~ The vertices of a triangle PQR

$$P(x_1, y_1) = (1, -3)$$

$$Q(x_2, y_2) = (4, k)$$

$$R(x_3, y_3) = (-9, 7)$$

$$\text{Area of } \triangle PQR = 15 \text{ cm}^2$$

$$\text{Area of } \triangle PQR = \frac{1}{2} [x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$$

$$15 = \frac{1}{2} [(1)(k - 7) + (4)(7 - (-3)) + (-9)(-3 - k)]$$

$$15 \times 2 = k - 7 + 4 \times 10 + (-9) \times (-3 - k)$$

$$30 = k - 7 + 40 + 27 + 9k$$

$$30 = 10k + 60$$

$$30 - 60 = 10k$$

$$-30 = 10k$$

$$k = \frac{-30}{10} = -3$$

$\therefore$ The value of k is -3

26. $\frac{1}{3} \sec^2 30^\circ - \frac{5}{6} \sin^2 45^\circ$

$$= \frac{1}{3} \left(\frac{2}{\sqrt{3}} \right)^2 - \frac{5}{6} \left(\frac{1}{\sqrt{2}} \right)^2$$

$$= \frac{1}{3} \times \frac{4}{3} - \frac{5}{6} \times \frac{1}{2}$$

$$= \frac{4}{9} - \frac{5}{12}$$

Q. No.

$$= \frac{4 \times 4 - 5 \times 3}{36}$$

$$= \frac{16 - 15}{36}$$

$$= \frac{1}{36}$$

27. LHS = $\tan \theta - \cot \theta$

$$\frac{\sin \theta}{\cos \theta}$$

$$= \frac{\sin \theta}{\cos \theta} - \frac{\cos \theta}{\sin \theta}$$

$$\frac{\sin \theta \cos \theta}{\sin \theta \cos \theta}$$

$$= \frac{\sin^2 \theta - \cos^2 \theta}{\sin \theta \cos \theta} \times \frac{1}{\sin \theta \cos \theta}$$

$$= \frac{\sin^2 \theta - \cos^2 \theta}{\sin^2 \theta \cos^2 \theta}$$

$$= \frac{\sin^2 \theta}{\sin^2 \theta \cos^2 \theta} - \frac{\cos^2 \theta}{\sin^2 \theta \cos^2 \theta}$$

$$= \sec^2 \theta - \operatorname{cosec}^2 \theta$$

28

Marks Pg. 12 & 13	E	M	CM
	4.0	4.0	

Q. No.

28. Given: A circle with centre O

OC is a radius with length 5 cm.

AB is a diameter with length $5 \times 2 = 10$ cm

$XAY \parallel CD$

$AM = 8$ cm //

$$AM = AO + OM$$

$$8 = 5 + OM \quad [AM = 8 \text{ cm (Given)}]$$

$$[AO = 5 \text{ cm (Radius of circle)}]$$

$$8 - 5 = OM$$

$$OM = 3 \text{ cm} //$$

①

$\angle OAX = 90^\circ$ [Tangent XAY perpendicular to radius OA at point of contact A]

$\angle OAX + \angle OMC = 180^\circ$ [$XAY \parallel CD$, AM is a transversal, $\angle$ interior angles]

$$90^\circ + \angle OMC = 180^\circ$$

$$\angle OMC = 90^\circ //$$

In $\triangle OMC$, $\angle OMC = 90^\circ$, By Pythagoras theorem

$$OC^2 = OM^2 + MC^2$$

$$5^2 = 3^2 + MC^2 \quad [OC = 5 \text{ cm (Radius)}]$$

~~25 = 9~~

[From ①]

$$25 - 9 = MC^2 //$$

$$16 = MC^2$$

$$MC = \sqrt{16} = 4 \text{ cm} \rightarrow \text{②}$$

$OM \perp CD$ [$\angle OMC = 90^\circ$]

$\therefore$ The perpendicular to a chord of the circle passing through the centre bisects the chord.

Q. No.

$$\therefore DM = MC = 4 \text{ cm [From (2)]}$$

Also,

$$DM + MC = DC$$

$$MC + MC = DC \quad \text{[From (3)]}$$

$$2MC = DC$$

$$2(4) = DC$$

$$DC = 8 \text{ cm}$$

29. $\therefore$ The highest frequency is 14

✓ 120 - 140 is the modal class

Lower limit of modal class (l) = 120

Class size of modal class (h) = $140 - 120 = 20$

Frequency of class preceding modal class (f_0) = 12

Frequency of modal class (f_1) = 14

Frequency of class succeeding modal class (f_2) = 8

$$\text{Mode} = l + h \left[\frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right]$$

$$= 120 + 20 \left[\frac{14 - 12}{2(14) - 12 - 8} \right]$$

$$= 120 + 20 \left[\frac{2}{28 - 20} \right]$$

$$= 120 + 20 \left[\frac{2}{8} \right]$$

$$= 120 + \frac{20 \times 5}{4}$$

$$= 120 + 5$$

$$= 125$$

$\therefore$ The modal daily income of the workers is ₹125.

Marks	E	M	CM
Pg. 14 & 15	5.0	5.0	

Q. No.

SECTION C

30. Let the two given zeroes of the polynomial be
 $x = \sqrt{3}$ and $x = -\sqrt{3}$

$$x = \sqrt{3}$$

$$x = -\sqrt{3}$$

$$x - \sqrt{3} = 0 \rightarrow \textcircled{1}$$

$$x + \sqrt{3} = 0 \rightarrow \textcircled{2}$$

Multiplying $\textcircled{1}$ and $\textcircled{2}$ we get,

$$(x - \sqrt{3})(x + \sqrt{3}) = 0$$

$x^2 - 3 = 0$ which is a factor of the polynomial.

On dividing the polynomial by $x^2 - 3$ we get

$$\begin{array}{r}
 x^2 - 3x - 4 \\
 x^2 - 3 \overline{) x^4 - 3x^3 - 7x^2 + 9x + 12} \\
 \underline{x^4 - 3x^2} \\
 (-) (+) \\
 - 3x^3 - 4x^2 + 9x \\
 \underline{- 3x^3 + 9x} \\
 (+) (-) \\
 - 4x^2 + 12 \\
 \underline{- 4x^2 + 12} \\
 (+) (-) \\
 0
 \end{array}$$

$$\therefore x(x) = 0$$

$\therefore x^2 - 3x - 4$ is also a factor of the polynomial

To find the other two zeroes set $x^2 - 3x - 4$ to 0

$$x^2 - 3x - 4 = 0$$

$$x^2 - 4x + x - 4 = 0$$

Q. No.

$$x(x-4) + 1(x-4) = 0$$

$$(x-4)(x+1) = 0$$

$$\Rightarrow x-4=0 \quad \text{OR} \quad x+1=0$$

$$x=4$$

$$\text{OR} \quad x=-1$$

$\therefore$ The other two zeroes of the polynomial are
 $x=4$ and $x=-1$

$$31. \quad 3x + 4y = 24 \rightarrow (1) \quad \times 11$$

$$20x - 11y = 47 \rightarrow (2) \quad \times 4$$

$$33x + 44y = 264 \rightarrow (3)$$

$$80x - 44y = 188 \rightarrow (4)$$

$$113x = 452$$

$$x = \frac{452}{113}$$

$$x = 4$$

$$\begin{array}{r} 240 \\ -44 \\ \hline 180 \\ -44 \\ \hline 113 \\ -4 \\ \hline 452 \end{array}$$

Substituting $x=4$ in (1) we get

$$3(4) + 4y = 24$$

$$12 + 4y = 24$$

$$4y = 12$$

$$y = \frac{12}{4}$$

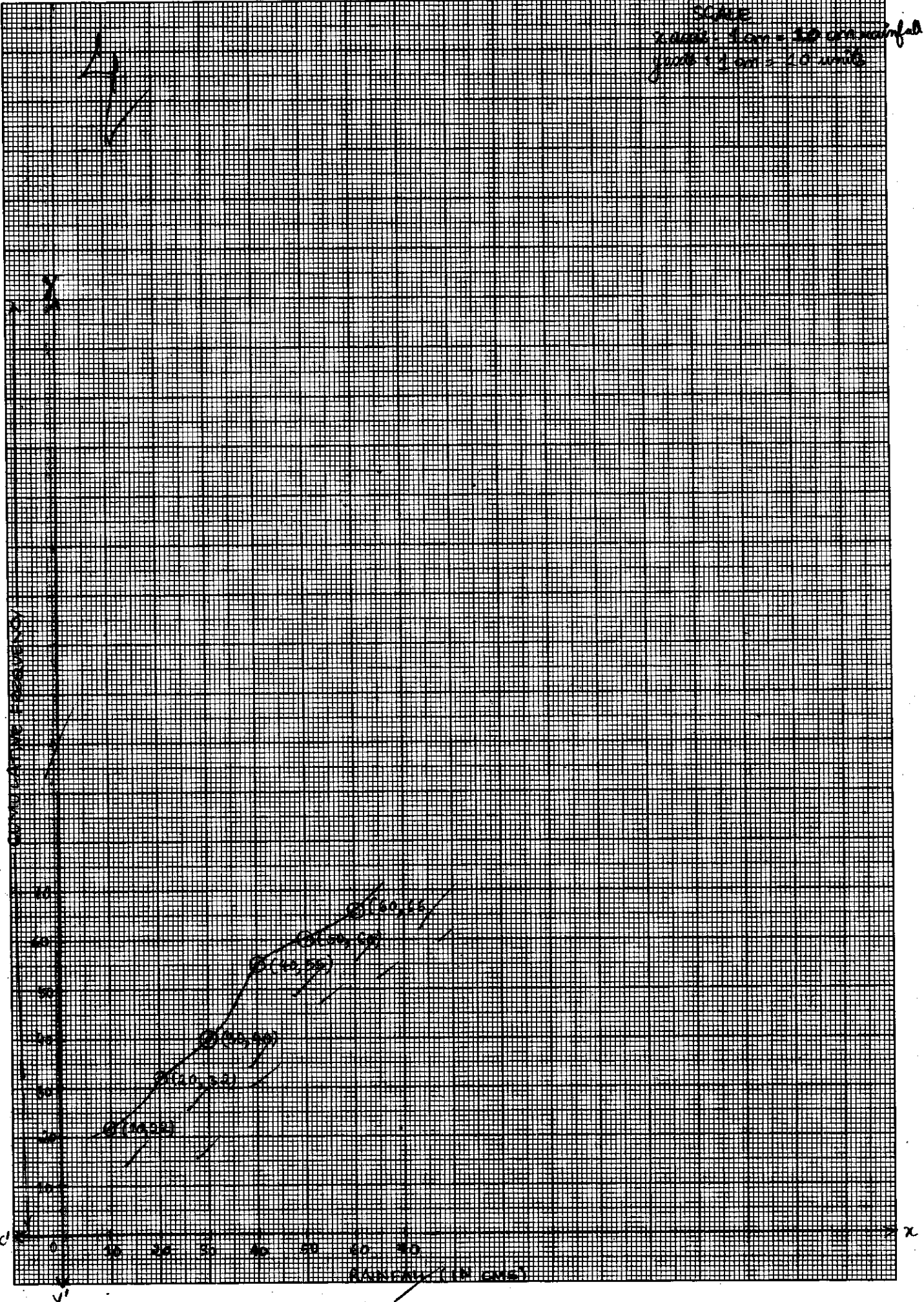
$$y = 3$$

$\therefore$ The solution of the given pair of linear equations in two variables is $x=4$ and $y=3$

Marks Pg. 16 & 17	E	M	CM
	7.0	7.0	

Q. No. 42

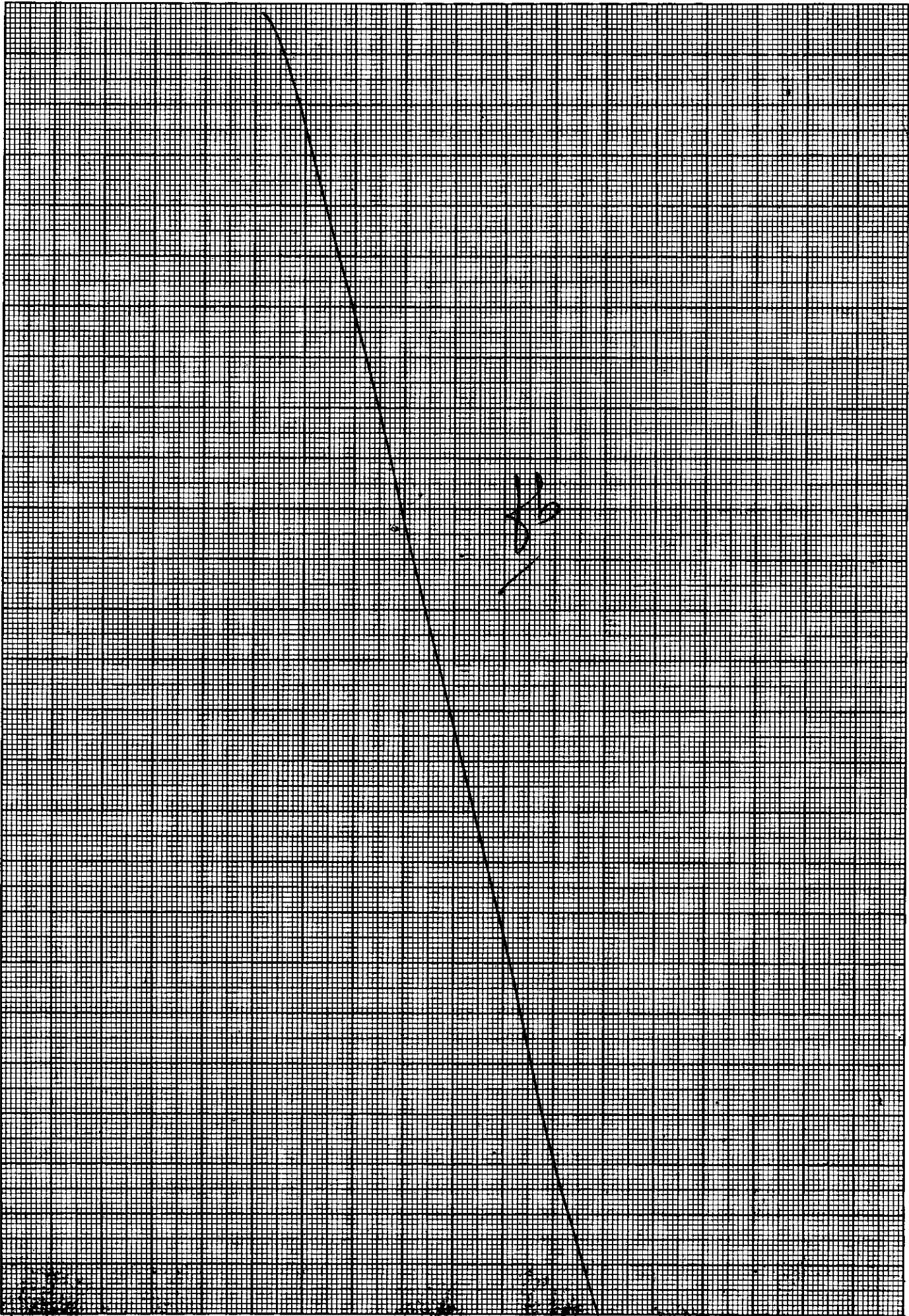
Centimeters



Marks Pg. 18	E	M	CM

Q. No.

Centimeters



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SSC/HSSC Examination March/April/June 20 25

Supplement Answer Book

Subject Code	S-2021
Date	11/03/2025

MARKS	E	M	CM
Pg. 1 to 4	9.0	9.0	

Hollow craft sticker

Q. No.		01
32.	$4x^2 - 5x - 21 = 0$ $4x^2 - 12x + 7x - 21 = 0$ $4x(x-3) + 7(x-3) = 0$ $(4x+7)(x-3) = 0$ $\Rightarrow 4x+7=0$ OR $x-3=0$ $4x = -7$ OR $x = 3$ $x = -\frac{7}{4}$	$\frac{24}{84}$ $\frac{1}{2} \frac{84}{42}$ $\frac{3}{4} \frac{28}{21}$ $\frac{6}{7} \frac{14}{12}$
33.	Given : $a = 10$ $n = 14$ $S_n = 1505$ $a_{25} = ?$ $S_n = \frac{n}{2} [2a + (n-1)d]$ $1505 = \frac{14}{2} [2(10) + (14-1)d]$	



$$1505 = 7 [20 + 13d]$$

$$1505 = 20 + 13d$$

$$7$$

$$215 - 20 = 13d$$

$$195 = 13d$$

$$d = \frac{195}{13} = 15$$

$$\begin{array}{r} 215 \\ - 20 \\ \hline 195 \\ 13 \times 15 \\ \hline 195 \\ \hline 0 \end{array}$$

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

$$a_{25} = 10 + (25-1)(15)$$

$$= 10 + 24 \times 15$$

$$= 10 + 360$$

$$= 370$$

$\therefore$ The 25th term of the arithmetic progression is 370.

34. Given: $BE = 5EC$

$$CF = 2EC$$

$$DE \parallel CA$$

$$DE = \frac{1}{2} CA$$

In line segment BC,

$$BC = BE + EC$$

$$= 5EC + EC \quad [\text{Given}]$$

$$= 6EC \rightarrow (1)$$

In line segment EF,

$$EF = EC + CF$$

$$= EC + 2EC \quad [\text{Given}]$$

$$= 3EC \rightarrow (2)$$

Dividing (2) by (1) we get

Q. No.



$$\frac{EF}{BC} = \frac{3EG}{6EG} = \frac{3}{6} = \frac{1}{2} \rightarrow (3)$$

Next $\frac{DE}{2} = \frac{1}{2} CA$

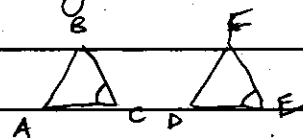
$$\frac{DE}{CA} = \frac{1}{2} \rightarrow (4)$$

From (3) and (4) we can say that

$$\frac{EF}{BC} = \frac{DE}{CA} \rightarrow (5)$$

Also, $DE \parallel AC$ [Given] and BF is a transversal
 $\therefore \angle BCA = \angle DEF$ [Alternate Interior angles]

$\rightarrow (6)$



From (5) and (6), In $\triangle DEF$ and $\triangle ABC$

$\triangle DEF \sim \triangle ABC$ [SAS similarity test]

$\angle BAM = \angle FDN$ [angles of similar triangles are equal]

$\rightarrow (7)$

Also, $\frac{DF}{AB} = \frac{EF}{BC} = \frac{DE}{AC}$

$$\frac{DF}{AB} = \frac{DE}{AC}$$

But $\frac{DE}{AC} = \frac{1}{2}$ [From (4)]

$$\therefore \frac{DF}{AB} = \frac{1}{2} \rightarrow (8)$$

~~$\therefore \frac{ar(\triangle DEF)}{ar(\triangle ABC)} = \left(\frac{DF}{AB}\right)^2 = \left(\frac{EF}{BC}\right)^2 = \left(\frac{DE}{AC}\right)^2$~~ [Ratio of areas of similar triangles is equal to ratio of squares of corresponding sides]

$\star$



~~$$\frac{\text{ar}(\triangle DNF)}{\text{ar}(\triangle ABC)} = \frac{(DN)^2}{(AB)^2} = \frac{1}{4} = \frac{1}{4} \quad [\text{From (8)}]$$~~

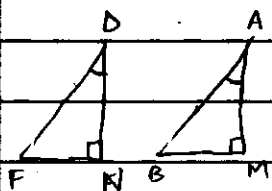
~~and~~

In $\triangle BAM$ and $\triangle FDN$,

$$\angle FDN = \angle BAM \quad [\text{From (7)}]$$

$$\angle FND = \angle BMA = 90^\circ \quad [\text{Each } 90^\circ] \quad [\text{Given}]$$

$$\therefore \triangle BAM \sim \triangle FDN \quad [\text{AA similarity test}]$$



~~and~~ $\therefore$ Ratio of the areas of similar triangles is equal to the ratio of the squares of the corresponding sides

$$\frac{\text{ar}(\triangle FDN)}{\text{ar}(\triangle BAM)} = \frac{(FD)^2}{(AB)^2} = \frac{(DN)^2}{(AM)^2} = \frac{(FN)^2}{(BM)^2}$$

$$\frac{\text{ar}(\triangle FDN)}{\text{ar}(\triangle BAM)} = \frac{(FD)^2}{(AB)^2} = \left(\frac{FD}{AB}\right)^2$$

$$= \left(\frac{1}{2}\right)^2 \quad [\text{From (8)}]$$

$$= \frac{1}{4}$$

$$\therefore 4 \text{ ar}(\triangle DNF) = \text{ar}(\triangle AMB)$$

Hence, proved.

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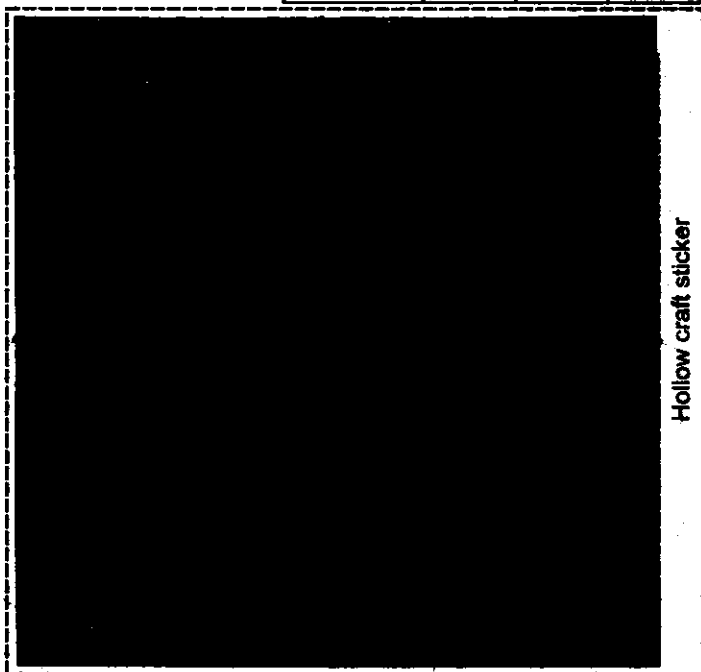


SSC/HSSC Examination March/April/June 2025

Supplement Answer Book

Subject Code	MA S-2021
Date	11/03/2025

MARKS	E	M	CM
Pg. 1 to 4	12.0	12.0	



Hollow craft sticker

Q. No.

01

35.

3

Given: Altitude of helicopter (AB) = 1200 m
Angle of depression ($\angle XAC$) to ship at C = 60°
Angle of depression ($\angle XAD$) to ship at D = 45°
Distance between ships (CD) = ?

$\angle XAC = \angle ACB$ [XA line of sight parallel to sea level
 $\angle XAD = \angle ADB$ BD, AC and AD are transversals,
 $\Rightarrow \angle ACB = 60^\circ$ and $\angle ADB = 45^\circ$ Alternate interior angles

In $\triangle ACB$, $\angle B = 90^\circ$

$$\tan(\angle ACB) = \frac{AB}{BC}$$

$$\tan(60^\circ) = \frac{1200}{BC}$$

$$\sqrt{3} = \frac{1200}{BC}$$

$$BC = \frac{1200}{\sqrt{3}} = \frac{1200\sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{1200\sqrt{3}}{3} = 400\sqrt{3} \text{ m}$$

$$BC = 400\sqrt{3} \text{ m} \rightarrow \textcircled{1}$$



In $\triangle ADB$, $\angle B = 90^\circ$

$$\tan(\angle ADB) = \frac{AB}{BD}$$

$$\tan 45^\circ = \frac{1200}{BD}$$

$$1 = \frac{1200}{BD}$$

$$BD = 1200 \text{ m} \rightarrow \textcircled{2}$$

D, C, B all lie in a straight line

$$\therefore DC + CB = BD$$

$$CD + 400\sqrt{3} = 1200$$

$$CD = 1200 - 400\sqrt{3}$$

$$CD = 400(3 - \sqrt{3})$$

$$CD = 400(3 - 1.732)$$

$$CD = 400 \times 1.268$$

$$CD = 4 \times 126.8$$

$$CD = 507.2 \text{ m}$$

$\therefore$ The distance between the two ships is 507.2 m

Handwritten signature or mark.

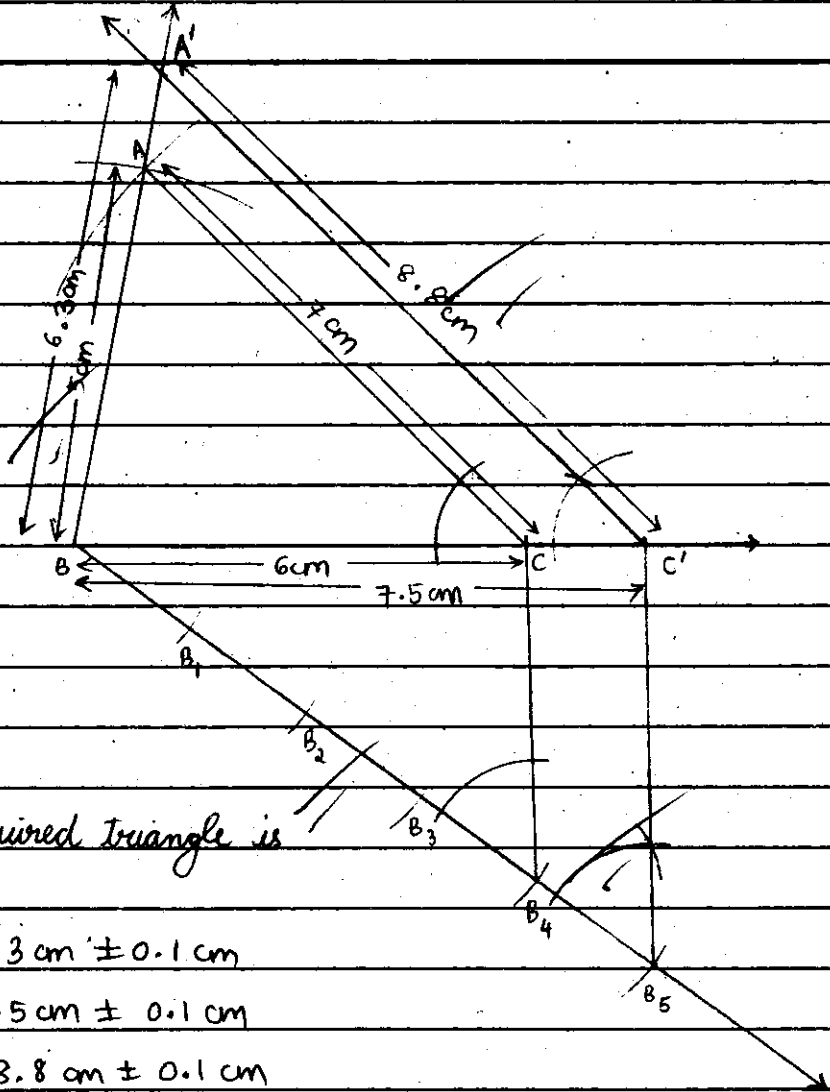
$$\begin{array}{r} 299 \\ 3.000 \\ -1.732 \\ \hline 1.268 \\ 123 \\ 136.8 \\ 4 \\ \hline 507.2 \end{array}$$

Q. No.



36.

3



The required triangle is $\triangle A'B'C'$

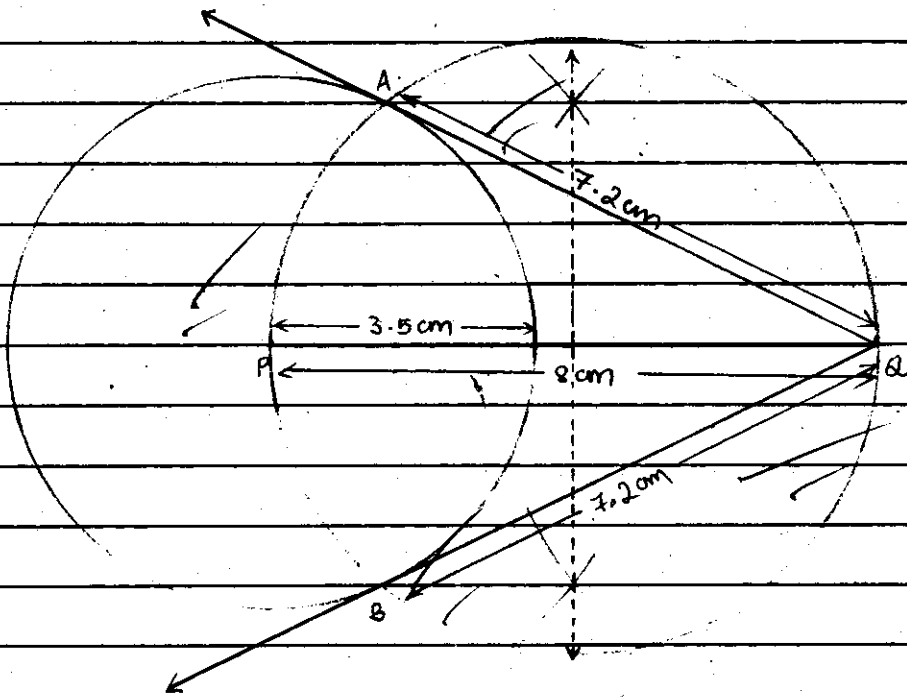
$$A'B = 6.3 \text{ cm} \pm 0.1 \text{ cm}$$

$$BC' = 7.5 \text{ cm} \pm 0.1 \text{ cm}$$

$$C'A' = 8.8 \text{ cm} \pm 0.1 \text{ cm}$$

37.

3



The tangent segments are QA and QB

$$QA = 7.2 \text{ cm} \pm 0.1 \text{ cm} \text{ and } QB = 7.2 \text{ cm} \pm 0.1 \text{ cm}$$



38.

Given : Height of cylinder (H) = 10 cm

Diameter of base of cylinder (D) = 8 cm

Radius of base of cylinder (R) = $\frac{D}{2} = \frac{8}{2} = 4$ cm

Height of cone (h) = 5 cm

Diameter of base of cone (d) = 6 cm

Radius of base of cone (r) = $\frac{d}{2} = \frac{6}{2} = 3$ cm

Volume of remaining solid = Volume of cylindrical block
- 2 (Volume of cone)

$$= \pi R^2 H - 2 \times \frac{1}{3} \pi r^2 h$$

$$= \pi \left[R^2 H - \frac{2}{3} r^2 h \right]$$

$$= \pi \left[4^2 \times 10 - \frac{2}{3} \times 3^2 \times 5 \right]$$

$$= \pi \left[16 \times 10 - \frac{2}{3} \times 9 \times 5 \right]$$

$$= \pi (160 - 30)$$

$$= 130 \pi$$

$$= 130 \times \frac{22}{7}$$

$$= \frac{2860}{7}$$

$$= 408.57$$

$$\approx 408.57 \text{ cm}^2$$

$\therefore$ The volume of the remaining solid
is 408.57 cm^2

$$\begin{array}{r} 130 \\ \times 22 \\ \hline 2600 \\ 2860 \\ \hline \end{array}$$

$$\begin{array}{r} 130 \\ \times 22 \\ \hline 260 \\ 2860 \\ \hline \end{array}$$

$$\begin{array}{r} 408.57 \\ 2860 \\ \hline 7480 \end{array}$$

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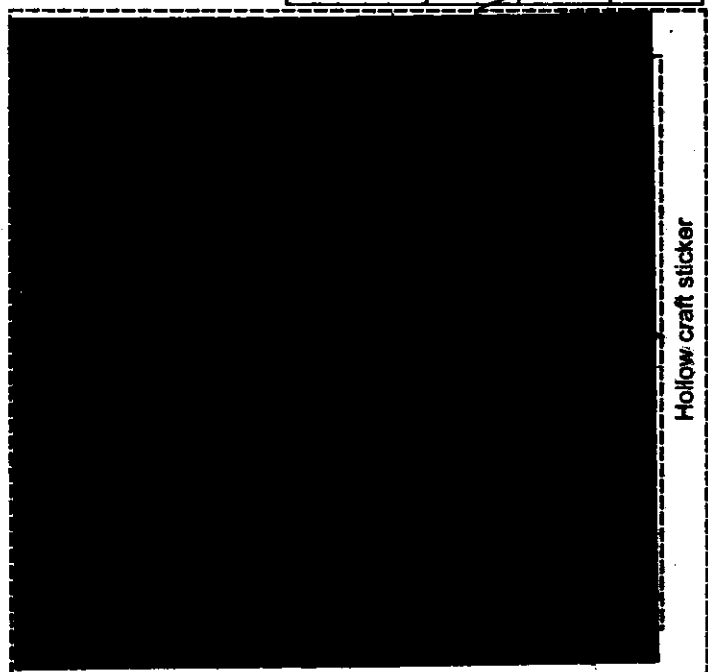
SSC/HSSC Examination March/April/June 20 25

Supplement Answer Book

Subject Code	5-2021
Date	11/03/2025

MARKS	E	M	CM
Pg. 1 to 4	10.5	10.5	

Hollow craft sticker



Q. No.		01
39.	$\text{Let } x = \frac{(5.96)^2 \times 29}{\sqrt{21.56}}$	
2 1/2	$\log x = 2 \log (5.96) + \log (29) - \frac{1}{2} \log (21.56)$	
	$= 2 \times 0.7752 + 1.4624 - \frac{1}{2} \times 1.3336$	3324
	$= 1.5504 + 1.4624 - 0.6668$	+ 12
	$= 3.3460$	3336
	$x = \text{antilog } (3.3460) \times$	0.7752
	$= 221.8$	1.5504
		1.4624
		3.0428
		-0.6668
		33460

SECTION D

40. Let the number of students in classroom A be x
 Let the number of students in classroom B be y

By the first condition we have,

$$x - 5 = y + 5$$

$$x - y = 10 \rightarrow \textcircled{1}$$

By the second condition we have,

$$2(y - 10) = x + 10$$

$$2y - 20 = x + 10$$

$$2y - x = 30$$

$$-x + 2y = 30 \rightarrow \textcircled{2}$$

Adding $\textcircled{1}$ and $\textcircled{2}$ we get,

$$x - y = 10$$

$$-x + 2y = 30$$

$$y = 40$$

Substituting $y = 40$ in $\textcircled{1}$ we get

$$x - 40 = 10$$

$$x = 10 + 40$$

$$x = 50$$

$\therefore$ The number of students initially in classroom A was 50 students and in classroom B was 40 students.

Q. No.

41. Let the original number of pens be n

Let the original rate per pen be x

By first condition

$$n = x \rightarrow \textcircled{1}$$

$\therefore$ Total original cost = xn

By second condition,

$$2n \left[x - \left(\frac{x-3}{4} \right) \right] = xn + 432$$

$$2x \left[x - \frac{x}{4} + 3 \right] = x^2 + 432 \quad \left[\begin{array}{l} \text{Substitute } n=x \\ \text{From } \textcircled{1} \end{array} \right]$$

$$2x \left[\frac{3x}{4} + 3 \right] = x^2 + 432$$

$$\frac{6x^2}{4} + 6x = x^2 + 432$$

$$6x^2 + 24x = 4x^2 + 1728 \quad [\text{Multiply both sides by 4}]$$

$$2x^2 + 24x - 1728 = 0$$

$$x^2 + 12x - 864 = 0 \quad [\text{Divide both sides by 2}]$$

$$a=1 \quad b=12 \quad c=-864$$

$$D = b^2 - 4ac$$

$$= 12^2 - 4(1)(-864)$$

$$= 144 + 3456$$

$$= 3600 \quad \Rightarrow D > 0 \therefore \text{The roots are real and distinct}$$

$$x = \frac{-b \pm \sqrt{D}}{2a} = \frac{-(12) \pm \sqrt{3600}}{2}$$

$$= \frac{-12 \pm 60}{2}$$

$$= -6 \pm 30$$

$$\Rightarrow x = -6 - 30$$

OR

$$x = -6 + 30$$

$$= -36$$

$$= 24$$

$\therefore$ Cost cannot be negative $\therefore x = -36$ is discarded

$\therefore$ The original cost of each pen is ₹ 24.

Q. No.

42. Cb on pg 17	Rainfall in cm (CI)	Number of days (f)	Cumulative Frequency
	0 - 10	22	22 ✓
	10 - 20	10	$22 + 10 = 32$ ✓
	20 - 30	8	$22 + 10 + 8 = 40$ ✓
	30 - 40	15	$22 + 10 + 8 + 15 = 55$ ✓
	40 - 50	5	$22 + 10 + 8 + 15 + 5 = 60$ ✓
	50 - 60	6	$22 + 10 + 8 + 15 + 5 + 6 = 66$ ✓

fb