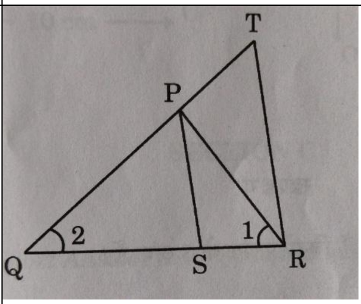
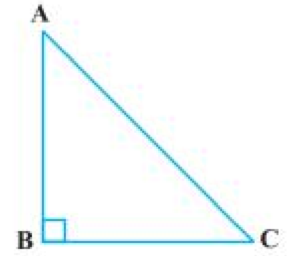
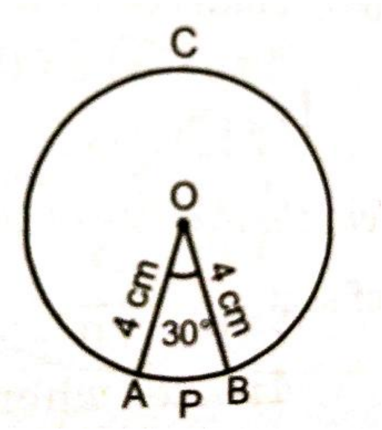
MARKING SCHEME, BSEH SAMPLE PAPER ,10TH MATHS(BASIC) , (2025-26)(ENGLISH MEDIUM)

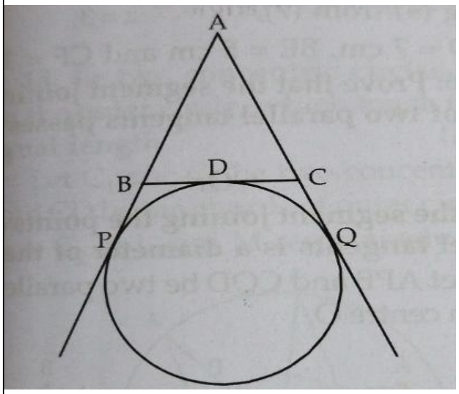
Q. no.	Expected solutions	marks
	Section-A	
1	(c)3,420	1
2	(b) exactly one prime factor	1
3	(d) $\frac{2}{3},\frac{-1}{7}$	1
4	(a)7	1
5	(a) irrational and distinct	1
6	(b)3	1
7	(b) $x = 5, y = 6$	1
8	(d) Y	1
9	(b) 50°	1
10	(b) $\frac{5}{3}$	1
11	(d) $\sqrt{2}$	1
12	(c)12.5cm	1
13	3πcm	1
14	1:3	1
15	30	1
16	Using mode= 3median-2mean Mode =24	1
17	$\frac{12}{52} = \frac{3}{13}$	1
18	LCM= $2^3\times 3^3 \times 5 = 1080$	1
19	(c) Assertion(A) is true but Reason(R) is false.	1
20	(d) Assertion(A) is false but Reason(R) is true.	1
	Section B	
21.(a)	Consider equations: x- y = 3……….(i) ; $\frac{x}{3}+\frac{y}{2}$ = 6…………(ii) Substituting value of x=y+3 from (i)in (ii),we get	1/2

	…………………………………………………………………………………………… $\frac{y+3}{3}+\frac{y}{2}=6 \Rightarrow 2y+6+3y=36$ …………………………………………………………………………………………… $\Rightarrow y=\frac{30}{5}$ =6 …………………………………………………………………………………………… Substituting value of y=6 in (i),we get x=9	1/2 1/2 1/2
22.(a)	Given: Height of the pole (h_1) = 10 m Shadow of the pole (s_1) = 15 m Shadow of the tower (s_2) = 45 m Let the height of the tower be h_2. …………………………………………………………………………………………… Since the triangles are similar, the ratios of corresponding sides are equal: $\frac{h_1}{s_1} = \frac{h_2}{s_2}$ ……………………………………………………………………………………	1/2 1/2

	Substitute the given values: $10/15 = h_2/45$ Simplify the ratio: $2/3 = h_2/45$ ………………………………………………………………………………………… Cross-multiply to solve for h_2: $h_2 = \frac{2}{3} \times 45 = 30m$ The height of the tower =30 m.	1/2 1/2
OR22.(b)	 We have, In ΔPQR, $\angle 2 = \angle 1$ $\Rightarrow \angle PQR = \angle PRQ$ $\therefore PQ = PR$ .....(i) ………………………………………………………………… Given, $\frac{QR}{QS} = \frac{QT}{PR}$ Using (i), we get, $\frac{QR}{QS} = \frac{QT}{QP}$ …………………………………………………………………………………… In ΔPQS & In ΔTQR	1/2 1/2

	$\frac{QR}{QS} = \frac{QT}{QP}$ ∠Q = ∠Q …………………………………………………………………………………… ∴ ΔPQS ~ ΔTQR [SAS similarity criterion]	1/2 1/2
23.(a)	tan(A+B) = $\sqrt{3}$ = tan60° ⇒A+B = 60°............(i) …………………………………………………………………………….. tan(A-B) = $\frac{1}{\sqrt{3}}$ = tan30° ⇒A- B = 30°..............(ii) …………………………………………………………………………………… Solving (i) and (ii),we get A= 45° …………………………………………………………………………………… and B= 15°	1/2 1/2 1/2 1/2
OR23.(b)	In ΔABC,tanA=BC/AB =1(see Figure)  i.e., BC=AB …………………………………………………………………………………… Let AB=BC=k, where k is a positive number. Now, AC= $\sqrt{AB^2 + BC^2} = \sqrt{k^2 + k^2} = \sqrt{2k^2}$= k$\sqrt{2}$ ……………………………………………………………………………………	1/2 1/2

	Therefore, sinA=BC/AC= k/k$\sqrt{2}$ =1/$\sqrt{2}$ and cosA=AB/AC= k/k$\sqrt{2}$ =1/$\sqrt{2}$ …………………………………………………………………………………………………… So, 2sinAcosA=2(1/$\sqrt{2}$)(1/$\sqrt{2}$)=1, which is the required value.	1/2 1/2
24.	Let A be the area of sector OAPB. ∴A= $\frac{\theta}{360} \times \pi r^2$,where r is the radius of the circle and θ is the angle of sector in degrees.  Here radius = 4cm and $\theta = 30°$ ……………………………………………………………… ∴ A= $\left(\frac{30}{360} \times 3.14 \times 4 \times 4\right) cm^2$ = 4.19cm^2 ……………………………………………………………………………………………… Total area of circle= πr^2 = $3.14 \times 4 \times 4\ cm^2$ = 50.24cm^2 ……………………………………………………………………………………………… ∴ Area of corresponding major sector OACB = Area of circle- Area of minor sector= = 50.24-4.19= 46.05cm^2	1/2 1/2 1/2 1/2

25.	 AP= AB+BP= AB+BD ………(1) [tangents from B] …………………………………………… AQ= AC+CQ= AC+CD………..(2) [tangents from C] ……………………………………………………………………….. Adding (1) and (2), AP+ AQ= AB+AC +(BD+CD)= = AB+AC+BC ………………………………………………………………………… But AP=AQ ∴ 2AP = Perimeter of ΔABC= 2(12)=24cm.	1/2 1/2 1/2 1/2
	Section C	
26.	Prove that $5-\sqrt{3}$ is irrational. If $\sqrt{3}$ is given an irrational number. **Solution:** Let, if possible , $5-\sqrt{3}$ be a rational number $\therefore 5-\sqrt{3} = \frac{p}{q}$, where p and q are co-prime integers and $q\neq 0$. --	1

	$\Rightarrow \sqrt{3} = \frac{p}{q} - 5$ $\Rightarrow \sqrt{3} = \frac{p-5q}{q}$ --- LHS=$\sqrt{3}$ = Irrational number given But RHS = $\frac{p-5q}{q} =$ Rational number which is not possible, therefore our assumption is wrong. Hence $5 - \sqrt{3}$ be a Irrational number.	1 1
27.	Find the quadratic polynomial whose zeroes are $3 - \sqrt{5}$ and $3 + \sqrt{5}$. Solution: Sum of zeroes ($\alpha+\beta$) = $(3 - \sqrt{5}) + (3 + \sqrt{5})$ = 6 --- Product of zeroes = ($\alpha.\beta$) = $(3 - \sqrt{5}) \times (3 + \sqrt{5})$ $= 3^2 - (\sqrt{5})^2$ = 9 – 5 = 4 --- Quadratic Polynomial = $K(x^2 - (\alpha+\beta)x + \alpha.\beta)$ $K(x^2 - 6x + 4)$ Taking K=1 ,we get $(x^2 - 6x + 4)$	1 1 1
28.(a)	Find the value(s) of K for which the following pair of linear equations have infinite number of solutions. 10x + 5y – (k-5) = 0 and 20x + 10y - k =0	

Solution:

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linear equations have infinite number of solutions given

$$\Rightarrow \frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$$ 1

$$\Rightarrow \frac{10}{20} = \frac{5}{10} = \frac{-k}{-(k-5)}$$

$$\Rightarrow \frac{1}{2} = \frac{1}{2} = \frac{-k}{-(k-5)}$$ ½

From (ii) and (iii) ⇒ (K-5)= 2K 1

⇒ 2K-k = -5

⇒ K=-5 ½

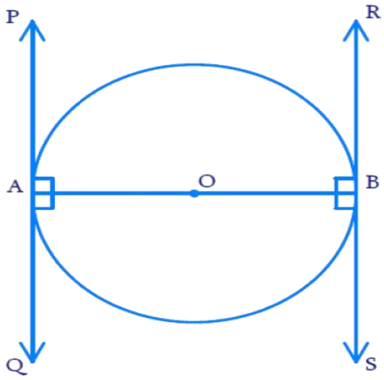
OR

28(b) Five years hence, the age of Manav will be three times that of his son. Five years ago Manav's age was seven times that of his son. What are their present ages?

Solution :

Let Manav's present age = x years

	Let son’s present age = y years.	
	Five years hence(later),	
	$x+5 = 3(y+5)$	
	⇒ $x+5 = 3y+15$	1
	⇒ $x-3y = 10$.......(1)	
	--	
	-	
	Also, five years ago(before),	
	$x-5 = 7(y-5$	1
	⇒ $x-5 = 7y-35$	
	⇒ $x-7y = -30$........(2)	
	--	
	-	
	Subtracting equation (2) from (1),	
	$x-3y = 10$	
	$-x+7y = 30$_(∵ eq.(2) changes its sign)	
	$4y = 40$	½
	∵ $4y = 40$	
	∴ $y = 10$	
	--	
	-	
	Put $y = 10$ in eq. (1),	½
	$x-3(10) = 10$ ⇒ $x-30 = 10$	
	⇒ $x = 40$	
	Thus, present age of Manav = x=40 years and	
	present age of Manav's son=y=10 years.	

29.		
	Given: A circle with centre o and AB is diameter where PQ is tangent at A and RS is tangent at B. To Prove: PQ II RS	1

	Proof: Since PQ is tangent at A OA ⊥ PQ {Tangent at any pt. of the circle is perpendicular to the radius at the pt. of contact} ∴ ∠PAO = 90°………………..(i)	½
	--	
	Similarly RS is tangent at B. OB ⊥ RS ∠OBS = 90°………………….(ii)	½
	--	
	From (i) and (ii) ∠PAO = ∠OBS = 90° But these are alternate interior angles. If the alternate interior angles are equal, then lines PQ and RS should be parallel.	1

	PQ II RS Hence, it is proved that tangents drawn at the ends of a diameter of a circle are parallel.	
30.(a)	Prove the identity $\sqrt{\frac{1+\text{sinA}}{1-\text{sinA}}} = secA + tanA$	
	Solution: Rationalising, we get	1
	LHS = $\sqrt{\frac{(1+sinA)(1+sinA)}{(1-sinA)(1+sinA)}}$	
	--	
	$= \sqrt{\frac{(1+sinA)^2}{1-sin^2A}}$	1
	$= \sqrt{\frac{(1+sinA)^2}{cos^2\,A}}$ (∵ 1- $\sin^2\theta = \cos^2\theta$)	
	--	
	$= \frac{(1+sinA)}{cosA}$	
	$= \frac{1}{cosA} + \frac{sinA}{cosA}$	1/2
	--	
	= SecA+ tanA	1/2
	--	

	OR 30(b) If Cosecθ – Sinθ = $\sqrt{5}$, then show that Cosecθ + Sinθ = 3 **Solution:** Cosecθ – Sinθ = $\sqrt{5}$ Squaring on both sides, we get $(\text{Cosec}\theta - \text{Sin}\theta)^2 = (\sqrt{5})^2$ -- -- $\text{Cosec}^2\,\theta + \text{Sin}^2\,\theta\text{- }2\ \text{Cosec}\theta\ .\ \text{Sin}\theta = 5$ $\text{Cosec}^2\,\theta + \text{Sin}^2\,\theta\text{- }2 = 5$ $\text{Cosec}^2\,\theta + \text{Sin}^2\,\theta\text{- }2+2-2 = 5$ $\text{Cosec}^2\,\theta + \text{Sin}^2\,\theta + 2-4 = 5$ -- -- $\text{Cosec}^2\,\theta + \text{Sin}^2\,\theta+2 = 5+4$ $(\text{Cosec}\theta + \text{Sin}\theta)^2 = 9$ Taking Sq. root on both sides, we get Cosecθ + Sinθ = 3	1 1 1
31.	A die is thrown once. Find the probability of getting (i) A prime number (ii) A number greater than 4 (iii) A number less than 6 **Solution:** Total numbers on a die = 6 Number of prime nos on a die= 3 Numbers greater than 4 = 2	

	Numbers less than 6 = 5 P(E) = $\frac{\text{no.of favourable outcomes to the event}}{\text{Total no.of possible outcomes}} =$ (i) Probability of getting prime no. = P(prime) = $\frac{3}{6} = \frac{1}{2}$ -- - (ii)Probability of getting no. greater than 4=P(greater than 4) = $\frac{2}{6}$ $=\frac{1}{3}$ …………………………………………………………………………………… (iii) Probability of getting no. less than 6 = P(less than 6) = $\frac{5}{6}$	1 1 1
	Section –D	
32.(a)	**SECTION-D** **Solution:** Let breadth of rectangular plot = x Let length of rectangular plot = 2x + 1 Area of rectangular plot = 528 m^2 -- Area of rectangular plot = Length × Breadth 528 m^2 = $x\,(2x+1)$ -- $2x^2 + x = 528$ $2x^2 + x - 528 = 0$ $2x^2 + 33x - 32x - 528 = 0$	1 1 1

= x$(2x+33)-16(2x+33)=0$

=$(2x+33)=0$ or $(x-16)=0$

$x=-33/2$ or $(x=16)$

As the breadth cannot be negative, x = $x=-33/2$ 1

Thus, the breadth of rectangular plot is 16 m

∴ the length of rectangular plot = $x+1$ 1

=2×16 + 1= 32 + 1= 33 m

OR

32(b) A Train travels a distance of 480 km at a uniform speed. If the speed had been 8 km/h less, than it would have taken 3 hours more to cover the same distance. Find the original speed of the train.

Solution : 1

Let original speed of the train be x km/h.

Then, time taken to travel 480 km with speed x km/h = 480/x hours

---

New speed = (x - 8) km/hr 1

Time taken to travel 480 km with speed (x - 8) km/hr = 480/(x - 8) hours

--- 1

ATQ $\frac{480}{x-8}-\frac{480}{x}=3$

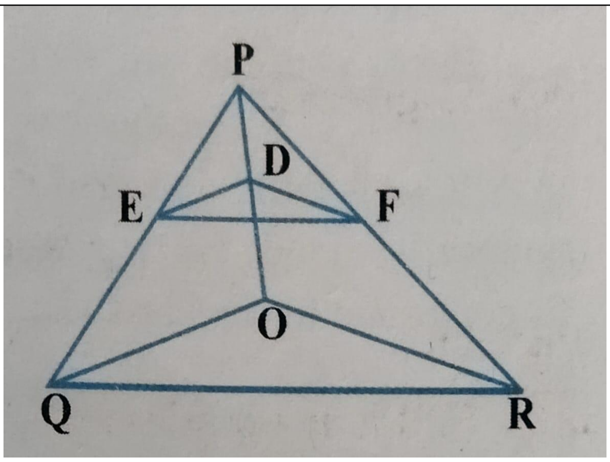
$480\ (\frac{1}{x-8}-\frac{1}{x})=3$

<table>
<tr><td></td><td>--
$480\ \left(\frac{x-x+8}{x(x-8)} \right)= 3$
$x^2 - 8x - 1280 = 0$

$x^2 - 40x + 32x - 1280 = 0$
$x(x-40) + 32(x-40) = 0$
$(x-40)(x+32)=0$
$x = 40$ or $x = -32$

As the speed cannot be negative, $x = -32$
Thus, the original speed of the train is 40 km/hr.</td><td>1

1</td></tr>
<tr><td>33.(a)</td><td>In ΔPQR,DE || OQ and DF||OR. Show that EF || QR</td><td></td></tr>
</table>



……………………………………………………………………………

Given: In ΔPOQ, $DE \parallel OQ$ and $DF \parallel OR$ ½+½

To prove: $EF \parallel QR$

……………………………………………………………………………

Proof: In ΔPOQ, $DE \parallel OQ$ 1

By basic proportionality theorem, we have

$$\frac{\mathbf{PE}}{\mathbf{EQ}} = \frac{\mathbf{PD}}{\mathbf{DO}} \text{ ....(i)}$$

……………………………………………………………………………

Similarly in ΔPOQ, $DF \parallel OR$ 1

By basic proportionality theorem, we have

$$\frac{\mathbf{PD}}{\mathbf{DO}} = \frac{\mathbf{PF}}{\mathbf{FR}} \text{ ....(ii)}$$

……………………………………………………………………………

From (i) and (ii) 1+1

$$\frac{\mathrm{PE}}{\mathrm{EQ}} = \frac{\mathrm{PF}}{\mathrm{FR}}$$

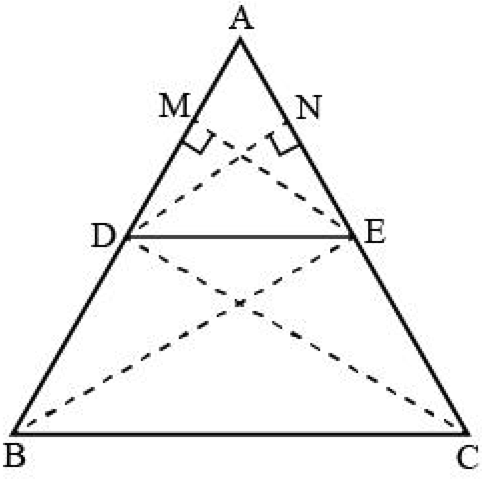
⇒ $EF \parallel QR$ Hence proved[By converse of Basic Proportionality Theorem]

OR

33(b) Prove that if a line is drawn parallel to one side of a triangle intersecting the other two sides in distinct points, then the other two sides are divided in the same ratio.

Solution:

Given: In ΔABC, DE||BC



1/2

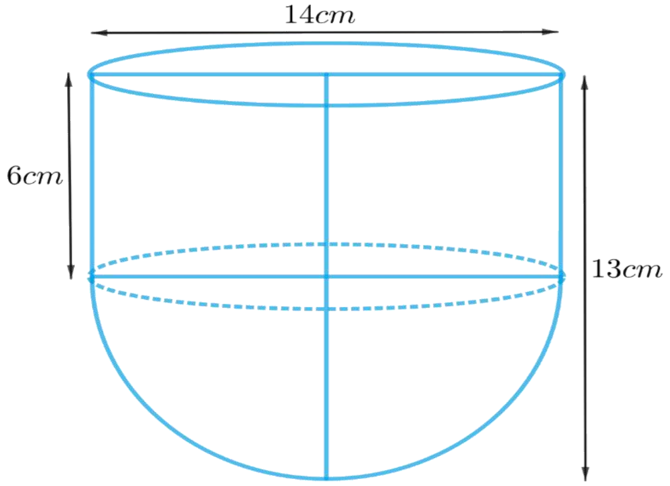
To prove: $\frac{\mathbf{AD}}{\mathbf{DB}} = \frac{\mathbf{AE}}{\mathbf{EC}}$

1/2

Construction : Draw EM⊥AB and DN⊥AC. Join B to E and C to D

Proof: In ΔADE and ΔBDE

	$\frac{\textbf{Area of}\Delta\textbf{ADE}}{\textbf{Area of }\Delta\textbf{BDE}} = \frac{\frac{1}{2}\times \textbf{AD}\times \textbf{EM}}{\frac{1}{2}\times \textbf{DB}\times \textbf{EM}} = \frac{\textbf{AD}}{\textbf{DB}}$--------------(i) -- In ΔADE and ΔCDE $\frac{\textbf{Area of}\Delta\textbf{ADE}}{\textbf{Area of }\Delta\textbf{CDE}} = \frac{\frac{1}{2}\times \textbf{AE}\times \textbf{DN}}{\frac{1}{2}\times \textbf{EC}\times \textbf{DN}} = \frac{\textbf{AE}}{\textbf{EC}}$ -----------------(ii) -- Since, DE||BC [Given] ∴ ar (ΔBDE) = ar (ΔCDE) -------------------------------------- (iii) [Δs on the same base and between the same parallel sides are equal in area] -- From eq. (i), (ii) and (iii) : $\frac{\textbf{AD}}{\textbf{DB}} = \frac{\textbf{AE}}{\textbf{EC}}$ Hence proved.	1 1 1 1
34.(a)	Solution:	



1

……

Radius of the hemisphere, r = 14/2 cm = 7 cm

Height of the hemisphere = radius of the hemisphere 1

Radius of the cylinder, r = 7 cm

Height of the cylinder = Total height of the vessel - height of the hemisphere

h = 13 cm - 7 cm = 6 cm 1

Inner surface area of the vessel = CSA of the hemisphere + CSA of the cylinder

$= 2\pi r^2 + 2\pi rh$ 1
$= 2\pi r\ (r + h)$

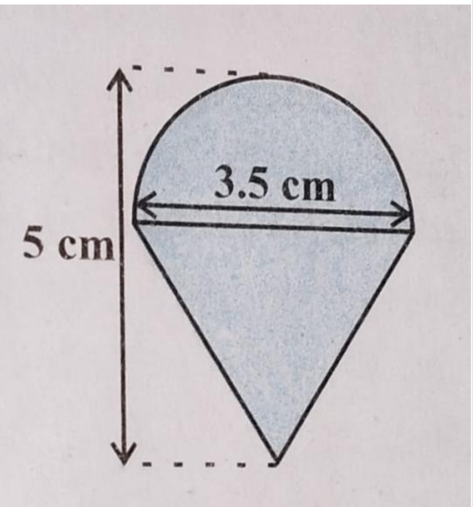
$= 2 \times 22/7 \times 7\text{cm}\ (7\ \text{cm} + 6\ \text{cm})$

$= 2 \times 22 \times 13\ \text{cm}^2$
$= 572\ \text{cm}^2$ 1
Thus, the inner surface area of the vessel is 572 cm^2.

OR

34(b)

Solution:



Radius of hemisphere = $\frac{3.5}{2}$ cm ½

Height of the cone= height of the top – height of the hemisphere $1\frac{1}{2}$

$= [5-\frac{3.5}{2}]$ cm = 3.25 cm

--

$l = \sqrt{r^2 + h^2} = \sqrt{\left(\frac{3.5}{2}\right)^2 + (3.25)^2} = 3.7$ cm $1\frac{1}{2}$

TSA of the toy = CSA of hemisphere + CSA of cone

$= 2\pi r^2 + \pi rl$

$= 2\times\frac{22}{7}\times\frac{3.5}{2}\times\frac{3.5}{2}+\frac{22}{7}\times\frac{3.5}{2}\times 3.7$

$= \frac{22}{7} \times \frac{3.5}{2} (3.5 + 3.7)$

$= \frac{11}{2} \times (3.5 + 3.7)$ cm^2 = 39.6 cm^2

$1\frac{1}{2}$

35.(a)

Percetage of female teachers	Number States/U.T. $(f_i$	(x_i) mid values	$u_i = \frac{x_i - a}{h}$	$f_i.u_i$
15-25	6	20	-3	-18
25-35	11	30	-2	-22
35-45	7	40	-1	-7
45-55	4	50	0	0
55-65	4	60	1	4
65-75	2	70	2	4
75-85	1	80	3	3
	$\sum f_i = 35$			$\sum f_i.u_i = -36$

1+1

1

Mean= $\bar{x} = a + \frac{\sum fi.ui}{\sum fi.} X h$

1

$\bar{x} = 50 + [\frac{-36}{35}] \times 10$

$= 39.71$

1

OR

35.(b)

Solution:

Monthly consumption (in units)	Number of consumers (f_i)	Cummulative Frequency (Cf)
65-85	5	5
85-105	4	9
105-125	13	22
125-145	20	42
145-165	14	56
165-185	8	64
185-205	4	68
	$\sum f_i = 68$	

1+1

$n = 68 \Rightarrow \frac{n}{2} = 34$ $\quad\therefore$ Median class = 125-145 1

So, $l = 125$, $f = 20$, $c\ f = 22$, $h = 20$

$$\text{Median} = l + \left(\frac{\frac{n}{2}-cf}{f}\right) \times h$$ 1

$$= 125 + \left(\frac{34-22}{20}\right) \times 20$$

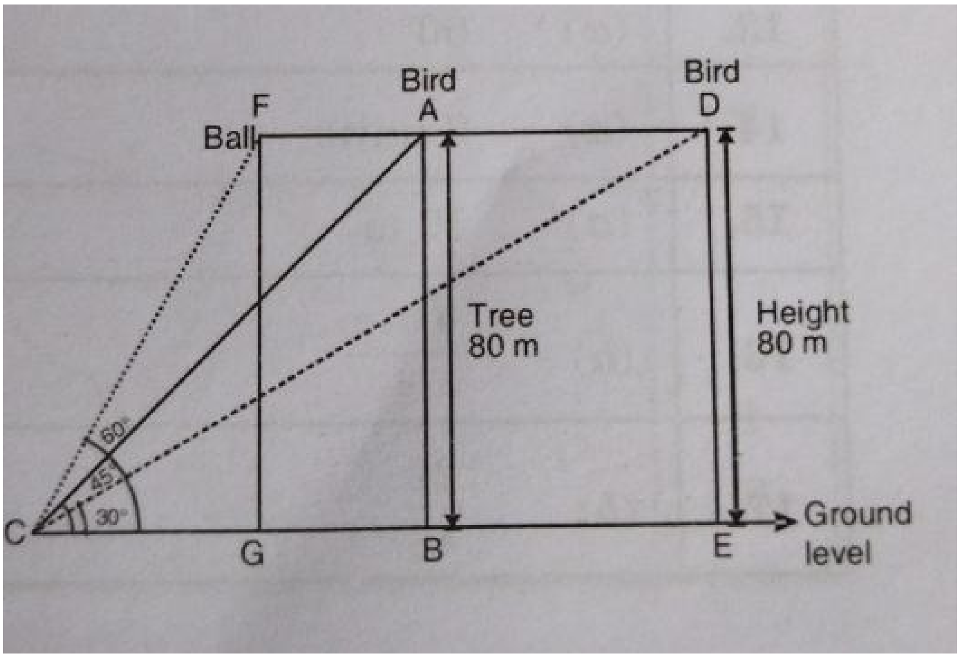
$$\text{Median} = 125 + \left(\frac{12}{20}\right) \times 20 = 125 + 12 = 137$$ 1

Section-E

36.	36.(i)First term,a=3,A.P. is 3,6,9,12,……..,24	1/2

	……………………………………………………………… Common difference,d= 6-3=3 (ii)a_n= a +(n-1)d ⇒34 = 3+(n-1)3⇒ n= $\frac{34}{3}$ = $11\frac{1}{3}$, which is not a positive integer. ……………………………………………………………………………………………. ∴ it is not possible to have 34 jars in a layer if the given pattern is continued. ………………………………………………………………………………………………. (iii) (a)S_n= $\frac{n}{2}[2a + (n-1)d]$= = $\frac{n}{2}[2 \times 3 + (n-1)3]$= $\frac{n}{2}[3+3n]$= $\frac{3n}{2}[1+n]$ ………………………………………………………………………………………… $S_8 = \frac{3 \times 8}{2}[1+8]$=108 OR (iii)(b)A.P. will be 6,9,12,……… Here,a=6,d=3 ………………………………………………………………………………………………. a_n= a +(n-1)d ⇒a_5=6 +(5-1)3= 18	1/2 1/2 1/2 1 1 1 1
37.	(i) Clearly,student A is sitting in the 4th quadrant.So, his coordinates are (2,-1).	1

	…………………………………………………………………… (ii)The coordinates of the sitting points of students A and B are (2,-1) and (-2,-3) respectively. ∴ By distance formula,AB=$\sqrt{(-2-2)^2+(-3+1)^2}$ = $\sqrt{16+4}$= $\sqrt{20}$ = $2\sqrt{5}$ units.	1
	…………………………………………………………………… (iii)(a)Clearly,the coordinates of the sitting points of students B and C are (-2,-3) and (3,-4) respectively.	1
	…………………………………………………………………… Since student stands at a point which is mid-point of BC. ∴Coordinates of the position of student D are $\left(\frac{-2+3}{2},\frac{-3-4}{2}\right)=\left(\frac{1}{2},\frac{-7}{2}\right)$.	1
	OR (iii)(b)Let R(α, β) be the coordinates of the point R which divides the join of A(2,-1) and C(3,-4) in the ratio 1:2.	1
	…………………………………………………………………… ∴ by section formula ,R(α, β)= $\left(\frac{1\times3+2\times2}{1+2},\frac{1\times-4+2\times-1}{1+2}\right)=\left(\frac{7}{3},-2\right)$	1
38.		



(i)In right ΔABC

tan $45°$ = $\frac{80}{\text{CB}}$ ⇒CB= 80 m. 1

……………………………………………………………………………………………

(ii)(a)In right ΔDEC 1

tan $30°$ = $\frac{80}{\text{CE}}$ ⇒ $\frac{1}{\sqrt{3}} = \frac{80}{\text{CE}}$ ⇒CE= $80\sqrt{3}$ m

……………………………………………………………………………………………… 1

Distance the bird flew = AD= BE= CE-CB= $80\sqrt{3}$ - 80 = $80(\sqrt{3}$-1)m

OR

(ii)(b)In right ΔFGC

	$\tan 60^\circ = \frac{80}{\mathrm{CG}} \Rightarrow \sqrt{3} = \frac{80}{\mathrm{CG}} \Rightarrow \mathrm{CG} = \frac{80}{\sqrt{3}}$	1
	…………………………………………………………………………………… Distance the ball travelled after hitting the tree = FA= GB= CB-CG GB= 80- $\frac{80}{\sqrt{3}}$ = 80(1- $\frac{1}{\sqrt{3}}$)m …………………………………………………………………………………………	1
	(iii)Speed of the bird= $\frac{\text{Distance}}{\text{Time taken}}$ = $\frac{20(\sqrt{3}+1)}{2}$ m/sec= $\frac{20(\sqrt{3}+1)}{2} \times 60$m/min= 600($\sqrt{3}+1$)m/min	1