Marking Scheme Strictly Confidential
(For Internal and Restricted use only) Secondary School Examination, 2026
SUBJECT NAME MATHEMATICS (BASIC) (Q.P. CODE 430/4/1)

General Instructions: -

1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.
2	**"Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, evaluation done and several other aspects. It's leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in News Paper/Website etc. may invite action under various rules of the Board and IPC."**
3	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. **However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In class-X, while evaluating two competency-based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, due marks should be awarded.**
4	The Marking scheme carries only suggested value points for the answers. These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.
5	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after deliberation and discussion. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
6	Evaluators will mark (✓) wherever answer is correct. For wrong answer CROSS 'X" be marked. Evaluators will not put right (✓) while evaluating which gives an impression that answer is correct and no marks are awarded. **This is most common mistake which evaluators are committing.**
7	If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.
8	If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.
9	If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out with a note **"Extra Question"**.
10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
11	A full scale of marks _(example 0 to 80/70/60/50/40/30 marks as given in Question Paper) has to be used. Please do not hesitate to award full marks if the answer deserves it.

12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).This is in view of the reduced syllabus and number of questions in question paper.
13	Ensure that you do not make the following common types of errors committed by the Examiner in the past:- Leaving answer or part thereof unassessed in an answer book. Giving more marks for an answer than assigned to it. Wrong totaling of marks awarded on an answer. Wrong transfer of marks from the inside pages of the answer book to the title page. Wrong question wise totaling on the title page. Wrong totaling of marks of the two columns on the title page. Wrong grand total. Marks in words and figures not tallying/not same. Wrong transfer of marks from the answer book to online award list. Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.) Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
14	While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0) Marks.
15	Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
16	The Examiners should acquaint themselves with the guidelines given in the "**Guidelines for spot Evaluation**" before starting the actual evaluation.
17	Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.
18	The candidates are entitled to obtain photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.

MARKING SCHEME
MATHEMATICS BASIC (Subject Code 241)

Section – A **20 × 1 = 20**

(Multiple Choice Questions)

Q. No. **1** to **20** are multiple choice questions of **1** mark each.

1. If HCF (850, 325) is 25, then LCM (850, 325) is :

(A) 442 (B) 11050

(C) 8450 (D) 2210

Answer : (B) 11050 — 1

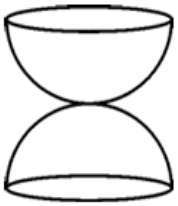
2. The value of k for which the equation $2kx^2 - 6x + 3 = 0$ has real and equal roots, is :

(A) $\frac{3}{2}$ (B) $\frac{1}{2}$

(C) $-\frac{3}{2}$ (D) 2

Answer : (A) $\frac{3}{2}$ — 1

3. Two wooden solid hemispheres of same radii r, are joined at a point, as shown in the figure. The total surface area of the object is :

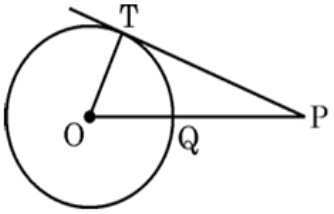


(A) $4\pi r^2$ (B) $6\pi r^2$

(C) $3\pi r^2$ (D) $5\pi r^2$

Answer : (B) $6\pi r^2$ — 1

4. PT is tangent to the circle with centre O and radius 5 cm. OP intersects the circle at Q. If PQ = x, then PT^2 equals :



(A) $x^2 + 5x$ (B) $x^2 + 10x + 50$

(C) $x^2 + 10x$ (D) $x^2 - 25$

Answer : (C) $x^2 + 10x$ 1

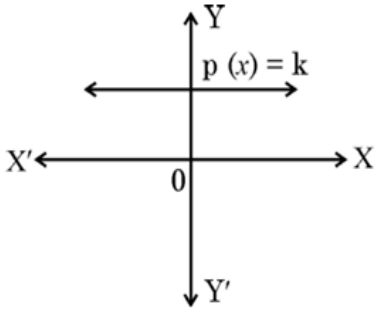
5. Probability of getting an irrational number at random from the numbers $\sqrt{3}, \sqrt{4}, 3\sqrt{9}, 3\sqrt{8}, \sqrt{5}, 0, 4^{\frac{3}{2}}$ is :

(A) 0 (B) $\frac{4}{7}$

(C) $\frac{3}{7}$ (D) 1

Answer : (C) $\frac{3}{7}$ 1

6. The graph of polynomial p(x) = k is shown here. Number of zeroes of polynomial p(x) is :



(A) 0 (B) 1

(C) 2 (D) infinitely many

Answer : (A) 0 1

7. The sum of first n terms of an A.P. is $50\sqrt{2}$. If the first and the last terms are $\sqrt{2}$ and $19\sqrt{2}$ respectively, then the value of n is :

(A) 10 (B) 5

(C) 15 (D) 20

Answer: (B) 5 1

8. While calculating mean of a grouped frequency distribution using step deviation method $\left(u = \frac{x - a}{h}\right)$ it was found that $\bar{x} = 62$, $a = 47.5$, $h = 5$. The value of $\bar{u}$ is :

(A) 3 (B) 14.5

(C) 2.9 (D) 3.1

Answer : (C) 2.9 — 1

9. A card is drawn from a well shuffled deck of 52 cards. The probability of getting an ace or a ten is :

(A) $\frac{1}{13}$ (B) $\frac{2}{13}$

(C) $\frac{1}{26}$ (D) $\frac{4}{13}$

Answer : (B) $\frac{2}{13}$ — 1

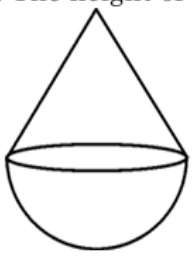
10. The distance between the points (– 4, 2) and (1, 0) is :

(A) $\sqrt{13}$ units (B) 3 units

(C) 9 units (D) $\sqrt{29}$ units

Answer : (D) $\sqrt{29}$ units — 1

11. A cone with slant height 10 cm and radius 6 cm is surmounted on a hemisphere of same radius. The height of the toy is :

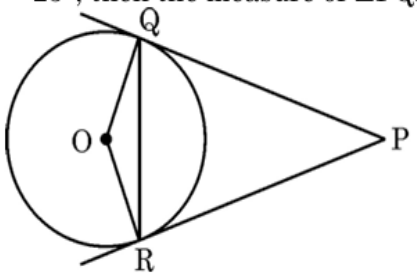


(A) 12 cm (B) 16 cm

(C) 14 cm (D) 10 cm

Answer : (C) 14 cm — 1

12. In the given figure, PQ and PR are two tangents drawn to a circle with centre O. If $\angle ORQ = 25°$, then the measure of $\angle PQR$ is :



(A) 65° (B) 25°

(C) 50° (D) 75°

Answer : (A) 65°	1

13. The value of $\sin 90° \cos 90° - \sin^2 60°$ is :

(A) $\frac{1}{4}$ (B) $\frac{3}{4}$

(C) $-\frac{3}{4}$ (D) $\frac{5}{4}$

Answer : (C) $-\frac{3}{4}$	1

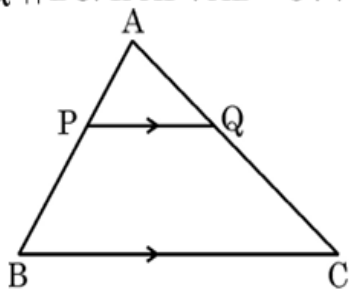
14. n^{th} term of the A.P. $-\frac{3}{2}, \frac{3}{2}, \frac{9}{2}, \ldots$ is :

(A) $\frac{3n}{2} - 3$ (B) $3n - \frac{9}{2}$

(C) $\frac{3n-9}{2}$ (D) $3n + \frac{3}{2}$

Answer : (B) $3n - \frac{9}{2}$	1

15. In the given figure, PQ || BC. If AP : AB = 3 : 7 then, AQ : QC equals :



(A) 3 : 7 (B) 3 : 10

(C) 7 : 3 (D) 3 : 4

Answer : (D) 3 : 4	1

16. If $\sin\theta = \frac{1}{7}$, then $\tan\theta$ is :

(A) $\frac{1}{4\sqrt{3}}$ (B) $\frac{1}{2\sqrt{3}}$

(C) $\frac{4\sqrt{3}}{7}$ (D) $\frac{6}{7}$

Answer : (A) $\frac{1}{4\sqrt{3}}$	1

17. $7 \times 29 \times 23 + 1$ is :

(A) a prime number. (B) divisible by 23.

(C) an odd number. (D) a composite number.

Answer : (D) a composite number	1

18. Chord AB subtends an angle of 40° at the centre of the circle of radius 9 cm. The length of arc AB is :

(A) $\frac{22}{7}$ cm (B) $\frac{198}{7}$ cm

(C) $\frac{44}{7}$ cm (D) $\frac{54}{7}$ cm

Answer : (C) $\frac{44}{7}$ cm	1

*Questions number **19** and **20** are Assertion and Reason based questions. Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below.*

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is ***not*** the correct explanation of Assertion (A).

(C) Assertion (A) is true, but Reason (R) is false.

(D) Assertion (A) is false, but Reason (R) is true.

19. **Assertion (A) :** The probability of an event can not be $\frac{1}{0.9}$.

Reason (R) : $0 \le P(E) \le 1$ for an event E.

Answer : (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)	1

20. **Assertion (A) :** 4^n can not end with the digit zero.

Reason (R) : Prime factorisation of 4^n is unique.

Answer : (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)	1

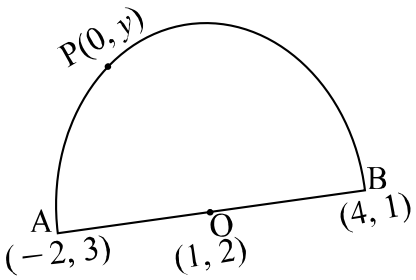
Section – B

(Very Short Answer Type Questions) **5 × 2 = 10**

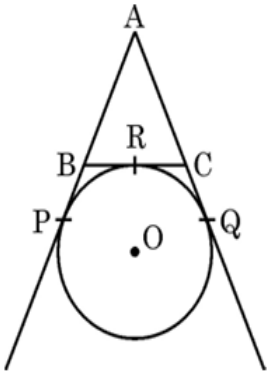
Q. Nos. **21** to **25** are Very Short Answer type questions of **2** marks each.

21. If $\sin(A - B) = \frac{1}{2}$ and $\tan(A + B) = \sqrt{3}$, $0° \le A + B < 90°$, $A > B$ then find the values of A and B.

Solution : $\sin(A - B) = \frac{1}{2} \Rightarrow A - B = 30°$ .....(i)	½

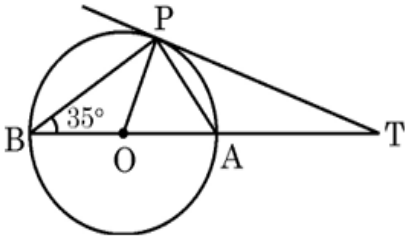
$\tan(A+B)=\sqrt{3} \Rightarrow A+B=60°$ ……. (ii) Solving (i) and (ii) to get $A=45°, B=15°$	½ 1
22. (a) If α, β are the zeroes of polynomial $p(x)=6x^2-5x-3$, then find the value of $\frac{1}{\alpha}+\frac{1}{\beta}$. **OR** (b) One zero of the polynomial $4x^2-12x+(2k+1)$ is five times the other. Find the value of k.	
Solution : (a) $\alpha+\beta=\frac{5}{6}, \ \alpha\beta=\frac{-3}{6}$ $\frac{1}{\alpha}+\frac{1}{\beta}=\frac{\alpha+\beta}{\alpha\beta}=\frac{-5}{3}$ **OR** (b) Let zeroes of the polynomial be α and 5α $\alpha+5\alpha=\frac{12}{4} \Rightarrow \alpha=\frac{1}{2}$ $\alpha\times 5\alpha=\frac{2k+1}{4}$ $k=2$	1 1 ½ ½ ½ ½
23. A (– 2, 3) and B (4, 1) are end points of the diameter of a semi-circle. The semi-circle intersects y-axis at point P. Find the co-ordinates of the point P.	
Solution:  Coordinates of centre O are $(\frac{-2+4}{2}, \frac{3+1}{2})$ i.e.(1, 2) Let the coordinates of point P be (0, *y*) Now $OP^2=OB^2 \Rightarrow 1^2+(2-y)^2=3^2+1^2$ $\Rightarrow y=5$ or $y=-1$ ∴ Coordinates of P are (0, 5) or (0, –1).	 ½ 1 ½

24. (a) In the given figure, AP, AQ and BC are tangents to the circle with centre O. If AB = 6 cm, AC = 7 cm and BC = 5 cm, then what is the length of AP ?



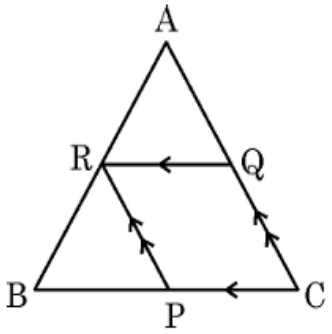
OR

(b) In the given figure, TP is tangent to a circle with centre O. Diameter BA when produced meets the tangent at T. If ∠ ABP = 35°, then find the measure of ∠ PTA.



Solution: (a) AP = AB + BP = AB + BR, AQ = AC + CQ = AC + CR	½
Adding corresponding sides, AP + AQ = AB + (BR + CR) + AC	½
Since AP = AQ,	
∴ 2AP = AB + BC + AC = 18	½
⇒ AP = 9 cm	½
OR	
(b) ∠BPO = ∠OBP = 35°, ∴ ∠BOP = 110°	1
∠OPT = 90° ∴ ∠PTA = 20°	1

25. In the given figure, QR || CB and RP || AC. If BR = 10 cm, QA = 12 cm, BP = 12 cm and PC = 18 cm, then find the lengths of AR and QC.



Solution: PR || CA $\therefore \frac{BP}{PC} = \frac{BR}{RA} \Rightarrow \frac{12}{18} = \frac{10}{AR} \Rightarrow$ AR = 15 cm — 1

QR || CB $\therefore \frac{AR}{RB} = \frac{AQ}{QC} \Rightarrow \frac{15}{10} = \frac{12}{QC} \Rightarrow$ QC = 8 cm — 1

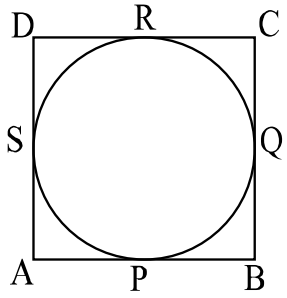
Section – C

(Short Answer Type Questions) **6 × 3 = 18**

Q. Nos. **26** to **31** are Short Answer type questions of **3** marks each.

26. Prove that a parallelogram circumscribing a circle, is a rhombus.

Solution:



For correct figure ½

Since length of tangents from external point of the circle are equal,

AP = AS
BP = BQ
CR = CQ
DR = DS

1

Adding corresponding sides of the above equations,

AP + BP + CR + DR = AS + BQ + CQ + DS

AB + CD = AD + BC

But AB = CD and AD = BC

1

Therefore, AB = BC, Hence ABCD is a rhombus.	½
27. A chord of a circle of radius 14 cm subtends a right angle at the centre. Find the area of the corresponding (i) minor segment (ii) major segment.	
Solution: (i) Area of minor segment $= \frac{90}{360} \times \frac{22}{7} \times 14 \times 14 - \frac{1}{2} \times 14 \times 14$ $= 56 \text{ cm}^2$ (ii) Area of major segment $= \frac{22}{7} \times 14 \times 14 - 56$ $= 560 \text{ cm}^2$	1 1 ½ ½
28. (a) Prove that $\frac{\cot A - \cos A}{\cot A + \cos A} = \frac{\sec A - \tan A}{\sec A + \tan A}$ **OR** (b) Prove that $(\text{cosec } A - \sin A)(\sec A - \cos A) = \frac{1}{\tan A + \cot A}$	
Solution: (a) LHS $= \frac{\cos A - \sin A \cos A}{\cos A + \sin A \cos A}$ $= \frac{1 - \sin A}{1 + \sin A}$ $= \frac{\frac{1}{\cos A} - \frac{\sin A}{\cos A}}{\frac{1}{\cos A} + \frac{\sin A}{\cos A}}$ $= \frac{\sec A - \tan A}{\sec A + \tan A}$ = RHS	1 ½ 1 ½

OR

(b) LHS $= \left(\frac{1}{\sin A} - \sin A\right)\left(\frac{1}{\cos A} - \cos A\right)$

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

$= \frac{\cos^2 A}{\sin A} \times \frac{\sin^2 A}{\cos A}$

$= \cos A \sin A$ 1

$= \frac{\sin A \cos A}{\sin^2 A + \cos^2 A}$

$= \frac{1}{\tan A + \cot A} = \text{RHS}$ 1

29. Prove that $\sqrt{5}$ is an irrational number.

Solution: Let $\sqrt{5}$ be a rational number such that $\sqrt{5} = \frac{p}{q}$ where p and q are co-prime integers and $q \neq 0$ ½

$\sqrt{5}q = p \Rightarrow 5q^2 = p^2$

5 divides $p^2 \Rightarrow$ 5 divides p as well 1

Let p = 5m (for some integer m)

$5q^2 = 25m^2 \quad \Rightarrow q^2 = 5m^2$

5 divides $q^2 \Rightarrow$ 5 divides q as well 1

p and q have a common factor 5, which is a contradiction as p and q are co-prime integers. ½

$\therefore$ our assumption is wrong

Hence, $\sqrt{5}$ is an irrational number.

30. Two dice are rolled together. Find the probability that :

(i) the sum of the numbers obtained is 10.

(ii) the product of the numbers obtained is 6.

Solution: (i) P(sum of the numbers obtained is 10) = $\frac{3}{36}$ or $\frac{1}{12}$ 1½

(ii) P(product of the numbers obtained is 6) = $\frac{4}{36}$ or $\frac{1}{9}$ 1½

31. (a) The vertices of a rhombus ABCD are A(– 3, – 4), B(5, – 3), C(1, 4) and D(– 7, 3). Find the length of both the diagonals. Hence, find area of the rhombus ABCD.

OR

(b) The line segment joining the points A (– 5, 1) and B (7, 6) is trisected at the points P and Q such that P is nearer to A. If P lies on the line $x + y = k$, then find the value of k.

Solution: (a) AC = $\sqrt{(1+3)^2+(4+4)^2} = 4\sqrt{5}$ — 1

BD = $\sqrt{(-7-5)^2+(3+3)^2} = 6\sqrt{5}$ — 1

Area of rhombus ABCD = $\frac{1}{2} \times 4\sqrt{5} \times 6\sqrt{5}$

$= 60$ — 1

OR

(b) AP : PB = 1 : 2 — ½

Coordinates of P are $\left(\frac{1\times7+2\times(-5)}{1+2}, \frac{1\times6+2\times1}{1+2}\right)$ i.e. $\left(-1, \frac{8}{3}\right)$ — 1½

As P lies on x + y = k therefore k = $-1+\frac{8}{3} = \frac{5}{3}$ — 1

Section – D

(Long Answer Type Questions) **4 × 5 = 20**

Q. Nos. **32** to **35** are Long Answer type questions of **5** marks each.

32. The third and ninth term of an A.P. are 4 and – 8 respectively.
(i) Which term of the A.P. is zero ?
(ii) Find the value of n if $S_n = -36$.

Solution: (i) $a + 2d = 4$ ….. (i) — ½

$a + 8d = -8$ ….. (ii) — ½

solving (i) and (ii) to get $d = -2$, $a = 8$ — ½ + ½

$a_n = 0 \Rightarrow 8 + (n-1)(-2) = 0$

$\Rightarrow n = 5$ i.e. 5^{th} term is zero. — 1

(ii) $S_n = -36 \Rightarrow \frac{n}{2}[16 + (n-1)(-2)] = -36$ — 1

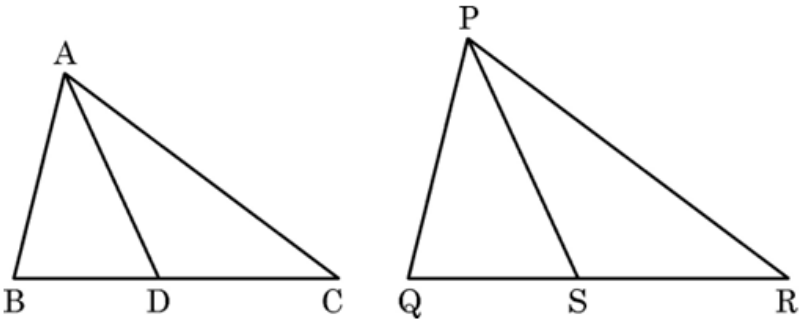
$\Rightarrow n^2 - 9n - 36 = 0$ — ½

$\Rightarrow (n-12)(n+3) = 0 \Rightarrow n = 12$ (rejecting n = –3) — ½

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

OR

(b)

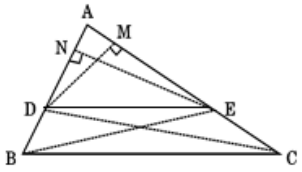


AD and PS are respectively, the medians of ΔABC and ΔPQR. If ΔABC ~ ΔPQR, then prove that

(i) ΔADC ~ ΔPSR

(ii) $\frac{AD}{PS} = \frac{BC}{QR}$

Solution: (a) Correct Given, To Prove, Construction, Figure — 4 x ½ =2



Given: In Δ ABC, DE ∥ BC

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

Construction: Draw DM ⊥ AC, EN ⊥ AB, join BE and CD

Proof : $\frac{ar(\Delta ADE)}{ar(\Delta DBE)} = \frac{\frac{1}{2} \times AD \times EN}{\frac{1}{2} \times DB \times EN} = \frac{AD}{DB}$ ……..(i) — 1

$\frac{ar(\Delta ADE)}{ar(\Delta DCE)} = \frac{\frac{1}{2} \times AE \times DM}{\frac{1}{2} \times EC \times DM} = \frac{AE}{EC}$ ……..(ii) — 1

As ΔDBE and ΔDCE lie on the same base and between same parallels BC and DE

∴ ar(ΔDBE) = ar(ΔDCE) $\Rightarrow \frac{ar(\Delta ADE)}{ar(\Delta DBE)} = \frac{ar(\Delta ADE)}{ar(\Delta DCE)}$ ……..(iii) — ½

From (i), (ii) and (iii), we get $\frac{AD}{DB} = \frac{AE}{EC}$ — ½

OR

(b) (i) $\Delta ABC \sim \Delta PQR \Rightarrow \frac{AB}{PQ} = \frac{AC}{PR} = \frac{BC}{QR} = \frac{2DC}{2SR}$ — 2

$\Rightarrow \frac{AC}{PR} = \frac{DC}{SR}$ — ½

and $\angle C = \angle R$ — ½

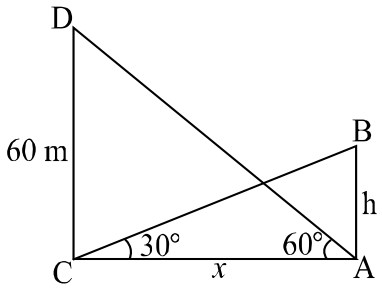
$\therefore \Delta ADC \sim \Delta PSR$ (by SAS similarity)

(ii) Since $\Delta ADC \sim \Delta PSR$, $\frac{AD}{PS} = \frac{DC}{SR}$ — 1

$\frac{AD}{PS} = \frac{BC/2}{QR/2} = \frac{BC}{QR}$ — 1

34. The angle of elevation of the top of a building from the foot of the tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 60°. If the tower is 60 m high, find the height of the building and distance between the building and the tower. (Use $\sqrt{3} = 1.73$)

Solution:



For correct figure:1

Let AB be the building and CD be the tower.

In ΔDCA, $\tan 60° = \frac{60}{x}$ — 1

$\Rightarrow x = 20\sqrt{3} = 34.6$ m — 1

In ΔBAC, $\tan 30° = \frac{h}{x}$ — 1

$\Rightarrow h = 20$ m — 1

35. (a) The difference between two numbers is 12. The greater number is 6 less than twice the smaller one.

(i) Representing the above situation, frame two linear equations in two variables.

(ii) Show that the equations have unique solution.

(iii) Solve the equations and hence find the numbers.

OR

(b) Solve the following equations graphically :

$x + y = 7$ and $2x - 5y = 7$

Solution: (a) (i) Let the larger number be x and smaller number be y

$x - y = 12$ — 1

$x - 2y = -6$ — 1

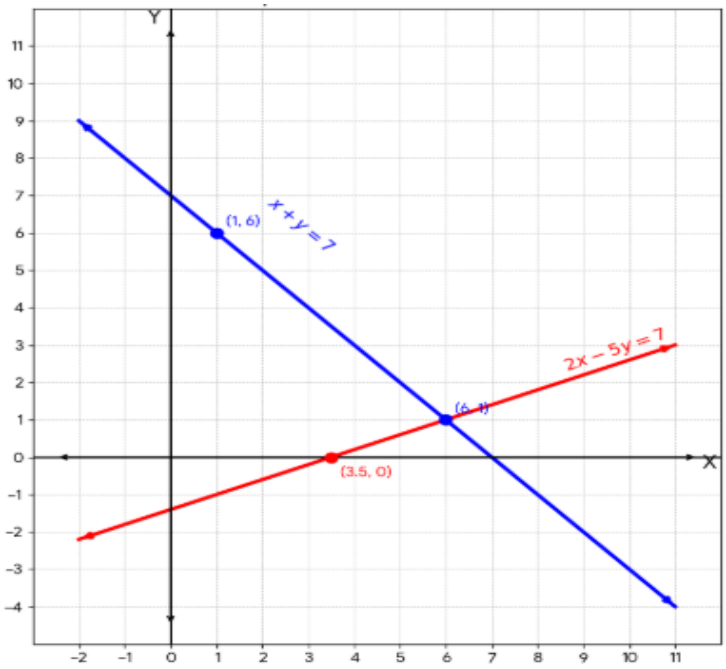
(ii) $\frac{a_1}{a_2} = \frac{1}{1}$ and $\frac{b_1}{b_2} = \frac{-1}{-2}$ — 1

$\frac{1}{1} \neq \frac{-1}{-2}$ $\Rightarrow$ equations have unique solution.

(iii) Solving the above equations to get $x = 30$ $y = 18$ — 1 + 1

OR

(b) Getting correct points and plotting correct lines. — 2+2



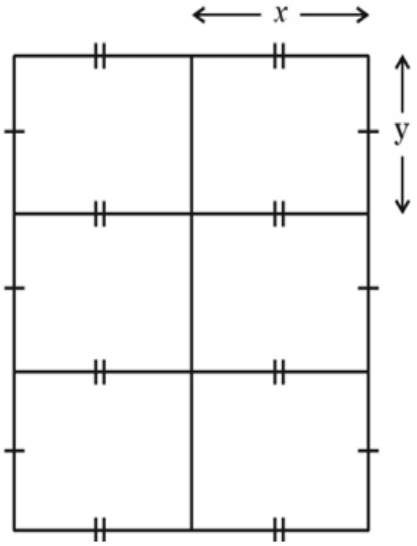
The solution is $x = 6$ and $y = 1$ — 1

Section – E

(Case-study based Questions) $3 \times 4 = 12$

Q. Nos. **36** to **38** are Case-study based Questions of **4** marks each.

36.



Observe the figure given above. It shows six identical rectangular enclosures made by using fencing wire mesh. These enclosures are used to protect baby animals in a zoo. Dimensions of each enclosure is x feet × y feet. The total length of fencing required is 152 feet and area of each enclosure is 80 square feet.

Based on the above, answer the following questions :

(i) Write an expression for length of fencing required in terms of x and y. **1**

(ii) Write the area of each enclosure in terms of x. **1**

(iii) (a) Write the above equation in quadratic equation form and thus find the dimensions of each enclosure using factorisation method. **2**

OR

(b) Using above equation in quadratic form, solve the equation and find the dimensions of each enclosure using quadratic formula. **2**

Solution: (i) $8x + 9y = 152$	1
(ii) $\frac{x(152-8x)}{9} = 80$	1
(iii) (a) $x^2 - 19x + 90 = 0$	½
	½
$(x - 10)(x - 9) = 0$	½

$x = 10$ or 9 ½

$\Rightarrow y = 8$ or $\frac{80}{9}$

OR ½

(b) $x^2 - 19x + 90 = 0$ ½

$\Rightarrow x = \frac{19 \pm \sqrt{361 - 360}}{2}$ ½

$\Rightarrow x = 10$ or 9 ½

and $y = 8$ or $\frac{80}{9}$

37.

CENTRAL POLLUTION CONTROL BOARD'S AIR QUALITY STANDARDS

AIR QUALITY INDEX (AQI)	CATEGORY
0-50	Good
51-100	Satisfactory
101-200	Moderate
201-300	Poor
301-400	Very Poor
401-500	Severe

The Air Quality Index (AQI) is a scale from 0 to 500 that indicates air quality, with higher numbers signifying more pollution and greater health concerns.

Mansi collected the daily data of AQI of her city for a month and presented it as given below :

AQI Range :	1 – 100	101 – 200	201 – 300	301 – 400	401 – 500
Number of Days :	3	9	12	4	2

(i) Convert the data to continuous frequency distribution. **1**

(ii) What is the quality of air in most of the days of the month ? **1**

(iii) (a) Using table formed in part (i), find mode of the data. **2**

OR

(b) Using table formed in part (i), find median of the data. **2**

Solution: (i)

Class Interval	frequency
0.5 -100.5	3
100.5 - 200.5	9
200.5 - 300.5	12
300.5 - 400.5	4
400.5 - 500.5	2

1

(ii) Air Quality is poor on most of the days

1

(iii) (a) Modal class is 200.5 - 300.5

$$\text{Mode} = 200.5 + 100\left(\frac{12-9}{2\times12-9-4}\right)$$

1½

$= 227.77$

½

OR

(b)

Class Interval	frequency	cf
0.5 -100.5	3	3
100.5 - 200.5	9	12
200.5 - 300.5	12	24
300.5 - 400.5	4	28
400.5 - 500.5	2	30

For correct table ½

Median class is 200.5 - 300.5

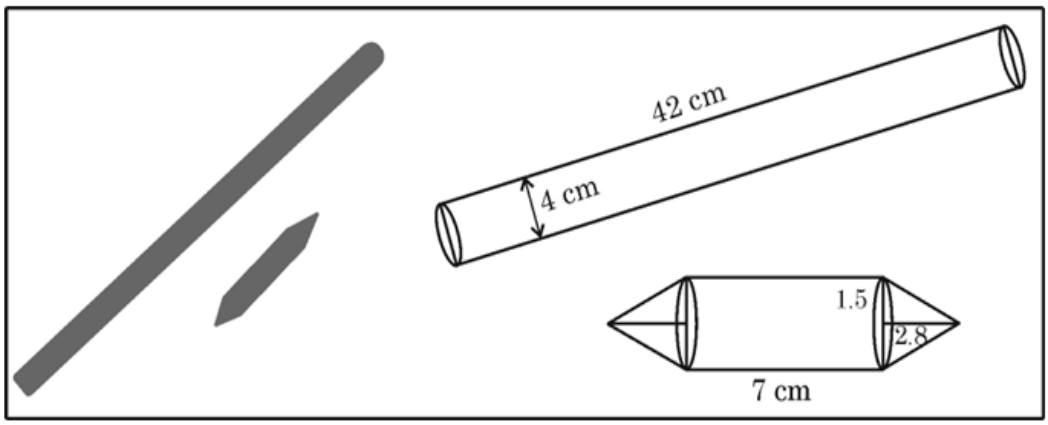
$$\text{Median} = 200.5 + \left(\frac{15-12}{12}\right) \times 100$$

1

$= 225.5$

½

38. 'Gilli Danda' is a very popular traditional game of India which is played with two wooden sticks – the larger one is called 'Danda' and smaller one 'Gilli'.



'Danda' – It is cylindrical in shape with diameter 4 cm and length 42 cm.

Gilli – It is cylindrical in middle with identical conical ends of same radius 1.5 cm and length 2.8 cm. The length of cylindrical part is 7 cm.

Based on the above, answer the following questions :

(i) Find the volume of wood used in making both the conical parts of Gilli. **1**

(ii) Find the volume of wood used in making cylindrical part of Gilli. **1**

(iii) (a) A cylindrical log of wood of radius 1.5 cm and length 14 cm is used to make Gilli. Find the volume of the wood scrapped. **2**

OR

(b) Find the total surface area of 'Danda'. **2**

Solution: (i) Required Volume $= 2 \times \frac{1}{3} \times \frac{22}{7} \times 1.5 \times 1.5 \times 2.8$ ½

$= 13.2 \text{ cm}^3$ ½

(ii) Required Volume $= \frac{22}{7} \times 1.5 \times 1.5 \times 7$ ½

$= 49.5 \text{ cm}^3$ ½

(iii) (a) Volume of cylindrical log $= \frac{22}{7} \times 1.5 \times 1.5 \times 14 = 99 \text{ cm}^3$ 1

Volume of gilli $= 13.2 + 49.5 = 62.7 \text{ cm}^3$ ½

Volume of wood scrapped $= 99 - 62.7 = 36.3 \text{ cm}^3$ ½

OR

(b) TSA of Danda $= 2 \times \frac{22}{7} \times 2 \times 2 + 2 \times \frac{22}{7} \times 2 \times 42$ 1

$= \frac{3872}{7} \text{ cm}^2$ or 553.14 cm^2 1