	KENDRIYA VIDYALAYA SANGATHAN **MUMBAI REGION** **I-PREBOARD EXAMINATION-(2025-26)** **Class-10** **MATHEMATICS (STANDARD)** **MARKING SCHEME** **Maximum Marks: 80** **Time: 3 hours**	
	SECTION A	1
1	(b) 2:1	1
2	(b) 2/3	1
3	(d) 6	1
4	(b) 8	1
5	(c) 3	1
6	(c) 8 units	1
7	(a) (3,-10)	1
8	(c) 3	1
9	(b) 1	1
10	(b) $75\sqrt{3}$	1
11	(a)90°	1
12	(c) 9π cm^2	1
13	(c) 125°	1
14	(a) $R_1{}^2 + R_2{}^2 = R^2$	1
15	(a) 3 cm	1
16	(c) 2/7	1
17	(d) 5/6	1
18	(d) 12/13	1
19	(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).	1
20	(d) Assertion (A) is false but reason (R) is true.	1
	SECTION B	
21	$404 = 2 \times 2 \times 101$ $96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$ Common factor = $2 \times 2 = 4$ $\therefore$ HCF = 4 LCM of 404 and 96 = $2 \times 2 \times 101 \times 2 \times 2 \times 2 \times 3 = 9696$ Verification: HCF × LCM = $4 \times 9696 = 38784$ Product of two numbers = $404 \times 96 = 38784$ $\therefore$ HCF × LCM = Product of two numbers	 1 1 1
22	Sin 60=$\sqrt{3}/2$ and simplification For correct answer $15\sqrt{3}$m **OR** For Correct Values For correct simplification and correct answer =55/6=9(1/6)	1 1 1 1

23	Given/TPT Correct proof/similar criteria	½ 1½
24	Given/TPT/Construction Correct proof	1 1
25	Correct Formula /Identification of sector angle and radius. Simplification and correct Area of the shaded portion that horse can graze = $616m^2$ OR Correct Formula /Identification of sector angle and radius. Simplification and correct Area=$51.31cm^2$	1 1 1 1
	SECTION C	
26	Let us assume, to the contrary, that √5 is rational. So, we can find integers a and b such that $\sqrt{5} = \frac{a}{b}$ where a and b are coprime. So, b √5 = a. Squaring both sides, we get $5b^2 = a^2$. Therefore, 5 divides a^2 and so 5 divides a. So, we can write a = 5c for some integer c. Substituting for a, we get $5b^2 = 25c^2$, that is, $b^2 = 5c^2$. This means that 5divides b^2, and so 5 divides b Therefore, a and b have at least 5 as a common factor. But this contradicts the fact that a and b have no common factors other than 1. This contradiction has arisen because of our incorrect assumption that √5 is rational. So, we conclude that √5 is irrational.	½ ½ ½ ½ ½ ½
27	For correct graph and point of intersection (1,0),(2,2) (3,0) the solution is x=2, y=2 Area=2 sq. units	2 ½ ½
28	Finding s =21 using area. S=[(x+6)+(x+8)+(6+8)]/2 21=(2x+28)/2 x=7 AB=7+6=13cm AC=7+8=15cm **OR** Tangents drawn to a circle from an external point are equal. So, AP = AS, PB = BQ, CR = CQ, DR = DS On adding the above equations, (AP+PB)+ (CR+RD) = (AS+BQ)+ (CQ+DS) ⟹AB+CD = AD+BC	½ ½ ½ ½ ½ ½ 1½ 1 ½
29	$p(x) = 2x^2 - x - 6$ $= 2x^2 - 4x + 3x - 6$ $= 2x(x - 2) + 3(x - 2)$ $= (x - 2)(2x + 3)$ Zeroes are: $x - 2 = 0$ or $2x + 3 = 0$	½ ½ ½

	x = 2 or x = −32 Correct Verification: a = 2, b = -1, c = -6	½ ½ ½
30	For correct expansion with proper use of algebraic identity For correct use of trigonometric identities Correct Result **OR** L.H.S. = $x^2 - y^2$ $= (p \sec\theta + q \tan\theta)^2 - (p \tan\theta + q \sec\theta)^2$ $= p^2 \sec\theta + q^2 \tan^2\theta + 2\, pq \sec^2 \tan^2$ $-(p^2 \tan^2\theta + q^2 \sec^2\theta + 2pq \sec\theta \tan\theta)$ $= p^2 \sec\theta + 2 \tan^2\theta + 2pq \sec\theta \tan\theta - p^2 \tan^2\theta - q^2 \sec\theta - 2pq \sec\theta \tan\theta$ $= p^2(\sec^2\theta - \tan^2\theta) - q^2(\sec?^2\theta - \tan^2\theta) =$ $= p^2 - q^2$ …[$\sec^2\theta - \tan^2\theta = 1$ = R.H.S.	1 1 1 ½ ½ ½ ½ ½ ½
31	∵ Maximum frequency = 12 ∴ Modal class = 40 – 60 Now, $l = 40$, $f_0 = 10$, $f_1 = 12$, $f_2 = 6$, $h = 20$ $\text{Mode} = l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times h = 40 + \frac{12-10}{2\times 12 - 10 - 6} \times 20 = 40 + \frac{2}{8} \times 20 = 45$	 ½ ½ ½+½ ½+½
	SECTION D	
32	Correct given, figure and construction Correct Proof For the correct proof of second part	2 1 2
33	Let the present age of the son be x years. Then, the present age of the man is $(2x^2)$ years. Age of the son 8 years hence =(x+8) years. Age of the man 8 years hence $(2x^2+8)$ years. $\therefore (2x^2+8)=3(x+8)+4$ $2x^2-3x-20=0 \Rightarrow 2x^2-8x+5x-20=0$ $2x(x-4)+5(x-4)=0 \Rightarrow (x-4)=0 \Rightarrow (x-4)(2x+5)=0$ $x-4=0$ or $2x+5=0$ $x=4$ or $x=-52$ x=4 [∵ age cannot be negative]. ∴ son's present age = 4 years, and man's present age $=(2\times4^2)$ years = 32 years.	 1 1 1 1 1
34	Height (h) of the cone = 8 cm radius (r) of the cone = 5 cm ∴ Volume of water flows out = 1 /4 × volume of cone $=1/4 \times 1/3 \times \pi r^2 h = 1/12 \times 25 \times 8$ ∴ Volume of water flows out =100× volume of spherical ball $1/12 \times 25 \times 8 = 100 \times 4/3 \times \pi R^3$ $\Rightarrow \pi R^3 = 1/8 \Rightarrow R = 1/2\text{cm} = 0.5\text{cm}$ **OR**	 ½ 1 1 1 1 ½

Radius of the cylindrical tent (r) = 14 m
Total height of the tent = 13.5 m
Height of the cylinder = 3 m
Height of the Conical part = 10.5 m
Slant height of the cone (l) = √(110.25 + 196) = √306.25 = 17.5 m ½
Curved surface area of cylindrical portion = 2πrh = 264 m^2 1
Curved surface area of conical portion =πrl =770 m^2 1
Total curved surface area = 264 m^2 + 770 m^2 = 1034 m^2 1
Provision for stitching and wastage = 26 m^2 ½
Area of canvas to be purchased = 1060 m^2 ½
Cost of canvas = Rate × Surface area = 500 x 1060 = ₹ 5,30,000/-
½

35

Class interval	f_i	Class mark x_i	f_ix_i
20 – 60	7	40	280
60 – 100	5	80	400
100 – 140	16	120	1920
140 – 180	12	160	1920
180 – 220	2	200	400
220 – 260	3	240	720
Total	$\sum f_i = 45$		$\sum f_ix_i = 5640$

½
½

$$\bar{x} = \frac{\sum f_ix_i}{\sum f_i} = \frac{5640}{45} = 125.33$$ 1

		Cumulative Frequency
20 – 60	7	7
60 – 100	5	12
100 – 140	16	28
140 – 180	12	40
180 – 220	2	42
220 – 260	3	45

1

n = 45

$$\Rightarrow \frac{n}{2} = \frac{45}{2} = 22.5$$

Median class = 100 – 140

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

$l = 100$, $\frac{n}{2} = 22.5$, $cf = 12$, $f = 16$, $h = 40$

$$\text{Median} = 100 + \frac{22.5 - 12}{16} \times 40$$
$$= 100 + 26.25$$
$$= 126.25$$ 1

OR

Class	Frequency	cf
0 – 5	4	4
5 – 10	6	10
10 – 15	10	20
15 – 20	f_1	$20 + f_1$
20 – 25	25	$45 + f_1$
25 – 30	f_2	$45 + f_1 + f_2$
30 – 35	18	$63 + f_1 + f_2$
35 – 40	5	$68 + f_1 + f_2$

Median = 24
median class = 20 – 25
I = 20. h = 5, n/2 = 50, cf = 20 + f1, f = 25

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

$$\Rightarrow 24 = 20 + \frac{50 - (20 + f_1)}{25} \times 5 \;\Rightarrow 4 = \frac{30 - f_1}{5} \Rightarrow 30 - f_1 = 20 \Rightarrow f_1 = 10$$

sum of frequencies = 100
⇒ 68 + f1 + f2 = 100
⇒ f1 + f2 = 32
⇒ 10 + f2 = 32
⇒ f2 = 22
f1 = 10, f2 = 22.

SECTION E

36

(i)

PR= $\sqrt{(8-2)^2 + (3-5)^2} = 2\sqrt{10}$ 1

(ii) Co-ordinates of Q (4,4). ½ ½
The mid-point of PR is (5,4)
∴Q is not the mid-point of PR

(iii) (A) Let the point be $(x,0)$ 1

So, $\sqrt{(2-x)^2 + 25} = \sqrt{(4-x)^2 + 16}$ 1

Hence $x = \frac{3}{4}$. Therefore the point is $(\frac{3}{4}, 0)$.

OR

(B) The coordinates of S will be 1

$\left(\frac{2\times4+3\times2}{2+3}, \frac{2\times4+3\times5}{2+3}\right)$ 1

$= \left(\frac{14}{5}, \frac{23}{5}\right)$

37	(i) $\sin 60° = PC/PA$ $\Rightarrow \sqrt{3}/2 = 18/PA$ $\Rightarrow PA = 12\sqrt{3}$ m (ii) $\sin 30° = PC/PB$ $\Rightarrow 1/2 = 18/PB$ $\Rightarrow PB = 36$ m (iii) $\tan 60° = PC/AC$ $\Rightarrow \sqrt{3} = 18/AC$ $\Rightarrow AC = 6\sqrt{3}$ m $\tan 30° = PC/CB$ $\Rightarrow 1/\sqrt{3} = 18/CB$ $\Rightarrow CB = 18\sqrt{3}$ m Width $AB = AC + CB = 6\sqrt{3} + 18\sqrt{3} = 24\sqrt{3}$ m OR $RB = PC = 18$ m & $PR = CB = 18\sqrt{3}$ m $\tan 30° = QR/PR$ $\Rightarrow 1/\sqrt{3} = QR/18\sqrt{3}$ $\Rightarrow QR = 18$ m $QB = QR + RB = 18 + 18 = 36$m. Hence height BQ is 36m	 ½ ½ ½ ½ 1 ½ ½ ½ 1 ½
38	(i) Savings of Ananya are Rs. 24, Rs. 30, Rs. 36, ... Since it is uniformly increasing by Rs. 6, therefore it forms an AP. Here, $a = 24$, $d = 30 - 24 = 6$ (ii) $a_{15} = a + 14d = 24 + 14 \times 6 = 24 + 84 =$ Rs. 108 (iii) $a_n = 66$ $\Rightarrow a + (n-1)d = 66$ $\Rightarrow 24 + (n-1)6 = 66$ $\Rightarrow n - 1 = 42/6 = 7$ $\Rightarrow n = 8$ OR $a_n = 8 - 5n$ $a_1 = 8 - 5 = 3$ $a_2 = 8 - 10 = -2$ $\Rightarrow d = a_2 - a_1 = -2 - 3 = -5$	1 1 ½ ½ ½ ½ ½ ½ ½ ½

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