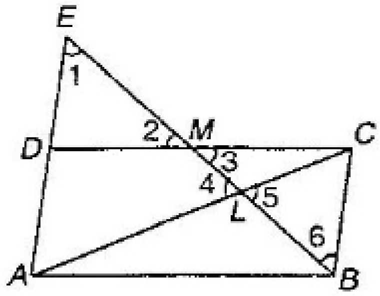
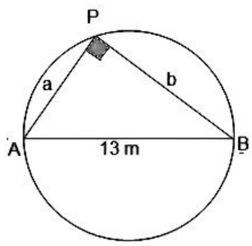
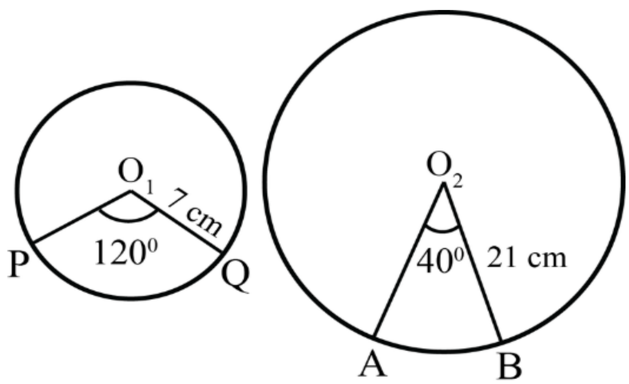
SAHODAYA PRE-BOARD EXAMINATION, 2024-25
CLASS: X
SUBJECT: MATHEMATICS (STANDARD-041)

MARKING SCHEME (SET-1)

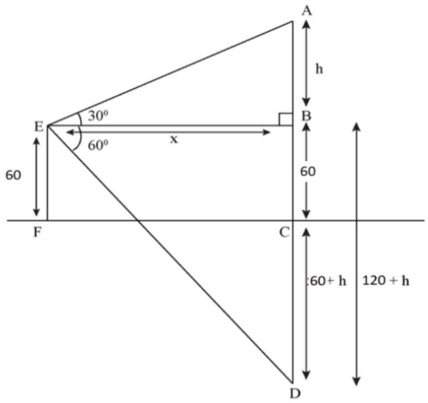
Q. NO	VALUE POINTS	BIT MARK	TOTAL
1	(B) $x^2 - 6x + 7$	1	1
2	(D) -9	1	1
3	(C) 50°	1	1
4	(D) 8	1	1
5	(B) $2r$ cm	1	1
6	(A) $\frac{1}{2}$	1	1
7	(A) 28°	1	1
8	(C) 7	1	1
9	(C) 30	1	1
10	(D) 20 cm	1	1
11	(B) 28	1	1
12	(B) $\frac{1}{2}$	1	1
13	(C) 40 cm^2	1	1
14	(A) $\frac{9}{13}$	1	1
15	(B) 5	1	1
16	(B) 12	1	1
17	(B) $(0, -1)$	1	1
18	(B) 14	1	1
19	(D) **A** is false but **R** is true.	1	1
20	(A) Both **A** and **R** are true and **R** is the correct explanation of **A.**	1	1
SECTION-B **(This section comprises of Very Short Answer (VSA) type questions of 2 marks each)**			
21	Let the lengths of the two pieces be 3x and 4x respectively. Then, 3x + 4x = 140 7x = 140 , x = 20	1	2

	So, the the lengths of the two pieces are 60 cm and 80cm. SO, the maximum length of the measuring stick = HCF of (60,80)= 20cm OR Since, $40= 5\times 2^3$, $42=2\times3\times 7$, $45= 3\times 3 \times 5$, LCM=2520cm The minimum distance is 2520cm	1 1 1	
22	No. of possible outcomes=50 Multiple of 3 or 5 = (3,5,6,9,10,12,15,18,20,21,24,25,27,30,33,35,36,39,40,42,45,48,50) No of favourable outcomes = 23 Probability $= \frac{23}{50}$ **OR** Possible out comes= 8 Total no of favourable outcomes= 7 Required probability= $\frac{7}{8}$	1 1 1 1	2
23	$\{(\sqrt{3}/2)^3\times\sqrt{3}\}$ - $\{2\times(\sqrt{2})^2\}+\{6\times1/2\times1\}$ =9/8-4+3 =9/8-1=1/8	1 1	2
24	Let the required ratio be $k:1$ By section formula $\left(\frac{k\times 6+1\times 2}{k+1},\frac{k\times(-3)+1\times 3}{k+1}\right)=(4,m)$ k=1,therefore the ratio is 1:1 m=0	1 1	2
25	If $P\ (x,y)$ is mid point of A (3,4) and B (k,6) then we have $\frac{3+k}{2}=x$ and $y=\frac{4+6}{2}=\frac{10}{2}=5$ Substituting above value in $x+y-10=0$ we have $\frac{3+k}{2}+5-10=0$ $\frac{3+k}{2}=5$ $3+k=10\Rightarrow k=10-3=7$	1 1	2

SECTION-C (This section comprises of Short Answer type questions (SA) of 3 marks each)			
26	Fig, given, to prove and construction For Correct proof **OR**  ∠1 = ∠6 (Alternate interior angles) ∠2 = ∠3 (Vertically opposite angles) DM = MC (M is the mid-point of CD) ΔEMD ≅ Δ BMC So, DE = BC (CPCT) Also, AD = BC (Opposite sides of a parallelogram) ⇒ AE = AD + DE = 2BC Now, ∠1 = ∠6 and ∠4 = ∠5 ΔELA~Δ BLC $\Rightarrow \frac{EL}{BL} = \frac{EA}{BC}$ $\Rightarrow \frac{EL}{BL} = \frac{2BC}{BC} = 2$ $\Rightarrow EL = 2BL$	1 2 1 1 1	3
27	Let P be the pole to be erected and A, B be the opposite fixed gates. Given, PA – PB = 7 Let PA = a, PB = b Hence a – b = 7 ⇒ a = 7 + b ..(1)  In right Δ PAB,	1	3

	$AB^2 = AP^2 + BP^2$ $13^2 = a^2 + b^2$ $169 = (7+b)^2 + b^2$ $169 = 49 + 14b + 2b^2$ Hence b=5 or –12 Therefore, b=5 $\Rightarrow$ a=7+5= 12 Hence, PA=12m and PB=5m	1 1	
28	$a = 1, \quad b = -p, \quad c = -p - c$ $\alpha + \beta = p, \quad \alpha\beta = -p - c$ LHS $(\alpha + 1)(\beta + 1)$ $\alpha\beta + (\alpha + \beta) + 1$ $-p - c + p + 1$ $= 1 - c$ RHS	1 1 1	3
29	LHS : $\frac{\sin\theta - \cos\theta + 1}{\sin\theta + \cos\theta - 1}$ Dividing both numerator and denominator by $cos\theta$ $= \frac{\tan\theta - 1 + sec\theta}{\tan\theta + 1 - sec\theta}$ $\frac{\tan\theta + sec\theta - (sec^2\theta - tan^2\theta)}{\tan\theta + 1 - sec\theta}$ $= \frac{(sec\theta + tan\theta)(1 + \tan\theta - sec\theta)}{\tan\theta + 1 - sec\theta}$ $= sec\theta + tan\theta$ $= \frac{1}{(\sec\theta - \tan\theta)}$	0.5 0.5 1 0.5 0.5	3
30	 Let the lengths of the corresponding arc be l_1 and l_2 Area of the sector with central angle O_1	1	3

	$=\frac{120}{360}\times\frac{22}{7}\times 49=154/3\ cm^2$ and area of the sector with central angle O_2 = = $\frac{40}{360}\times\frac{22}{7}\times 21\times 21$ $=154\ cm^2$ Now, corresponding arc length of the sector PO_1QP $=\frac{120}{360}\times 2\pi r= 44/3cm$ Now, corresponding arc length of the sector AO_2BA $=\frac{40}{360}\times 2\pi r= 44/3cm$ Hence, we observe that arc lengths of two sectors of two different circles may be equal but their area need not be equal. **OR** Time =36 min= $\frac{36}{60}\ hrs$ Central angle $(\theta)= 30\times\frac{36}{60}=18^{\circ}$ Finding the correct area = $\frac{\theta}{360}\pi r^2 = 5.66\ cm^2$	1 1 1 2	
31	Let $2-3\sqrt{5}$ is rational $2-3\sqrt{5}=\frac{p}{q}$, p and q are co prime, $q\neq 0$ $\sqrt{5}=\frac{2q-p}{3q}$ $\Rightarrow \sqrt{5}$ is rational this cointradict the fact that $\sqrt{5}$ is given irrational hence $2-3\sqrt{5}$ is irrational	1/2 1.5 1	3
SECTION D **(This section comprises of Long Answer (LA) type questions of 5 marks each)**			
32	For correct tabulation and graph finding area= $\frac{1}{2}\times 4\times 4=8$ sq. unit **OR** Let the fixed charges be rupees x and charges per kilo meter rupees y $x+10y=75$ …………….(1) $x+15y=110$ …………(2) Solving for $x=5$ and $y=7$ Finding correct charges for 35km = Rs. 250	3 1 1 1+1 2 1	5

33	Finding semi-perimeter (S) $= x + 14\ cm$ Finding area of ΔABC by Herons formula $= \sqrt{48x(x+14)}$ $ar(\Delta ABC) = ar(\Delta AOB) + ar(\Delta BOC) + ar(\Delta AOC)$ $\sqrt{48x(x+14)} = \frac{1}{2} \times 4(x+8) + \frac{1}{2} \times 4 \times 14 + \frac{1}{2} \times 4(x+6)$ By solving the value of $x = 7$ The value of $AB = 15\ cm$ and $AC = 13\ cm$	1 1 2 1	
34	for fig  In ΔABE, we have $\tan 30^\circ = h/x$ $\Rightarrow \frac{1}{\sqrt{3}} = h/x$ $\Rightarrow x = h\sqrt{3}$……(1) In ΔBDE, we have $\tan 60^\circ = \frac{120+h}{x}$ $\Rightarrow \sqrt{3} = \frac{120+h}{h\sqrt{3}}$ $\Rightarrow 3h = 120 + h$ $\Rightarrow 2h = 120$ $\Rightarrow h = 60$ m Hence, height of cloud above the lake =60+h=60+60=120 m	1 1 1 1 1	5

35 | | 5

C.I	frequency	c.f
0-10	5	5
10-20	X	5+x
20-30	6	11+x
30-40	Y	11+x+y
40-50	6	17+x+y
50-60	5	22+x+y
	22+x+y	

1

22+x+y=40 --------(1)

$x + y = 18$

median class=30-40 ½

½

median=$L + \frac{\frac{N}{2} - C.F}{F} \times h$ ½

l=30,n=40,cf=11+x,f=y, h=10 1

10x+y=90 ----------(2) 1

Solving eq (1) and eq (2) ½

X=8, Y=10

OR

C.I	fi	xi	fixi
100-120	10	110	1100
120-140	15	130	1950
140-160	20	150	3000
160-180	22	170	3740
180-200	18	190	3420
200-220	12	210	2520
220-240	13	230	2990
	110		18720

2

Mean=18720/110=170.18 ½

Modal class=160-180 ½

Mode=$L + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times h$ ½

L=160,$f_1 = 22, f_0 = 20, f_2 = 18, h = 20$ 1

Calculating Mode=$166\frac{2}{3}$ ½

SECTION E **(This section comprises 3 case-based questions of 4 marks each)**			
36	(i) $a_2 = 18000, a_{10} = 19800$ $a + d = 18000$ $a + 9d = 19800$ Finding d=225 and a=17775 (ii) $a_7 = a + 6d = 19125$ (iii) (a) $s_{10} = 187875$ **OR** (b) $a_{10} + a_{11} + a_{12} = 19800 + 20025 + 20250$ $= 60075$	1 1 2 2	4
37	(i) height of tower=100m (ii) length of shadow=60m (iii) (a) length of shadow of Ajay's house=16m **OR** (b)length of shadow of Bijay's house=8m	1 1 2 2	4
38	(i) Number of person that can be accommodated is 14 (ii) CSA of conical part=3080m^2 (iii) (a) canvas needed =$2\pi rh + \pi rl = 5544m^2$ **OR** (b) volume of tent= $\pi r^2 h + \frac{1}{3}\pi r^2 h = 51744m^3$	1 1 2 2	4