INDIAN SCHOOL AL WADI AL KABIR
SECOND REHEARSAL EXAMINATION 2025-26
MATHEMATICS (STANDARD) - 041
ANSWER KEY CLASS-X

SET: 1

Time allowed: 3 Hrs. **Maximum Marks: 80**

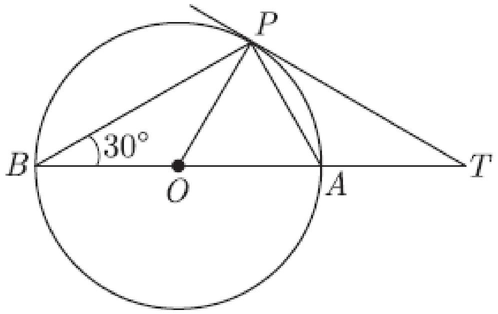
General Instructions:

Read the following instructions very carefully and follow them:

1. This Question Paper has 5 Sections A - E.
2. Section **A** has 20 Multiple Choice Questions (MCQs) carrying 1 mark each.
3. Section **B** has 5 questions carrying 02 marks each.
4. Section **C** has 6 questions carrying 03 marks each.
5. Section **D** has 4 questions carrying 05 marks each.
6. Section **E** has 3 Case Based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
8. Draw neat figures wherever required. Take π = $\frac{22}{7}$, wherever required if not stated.

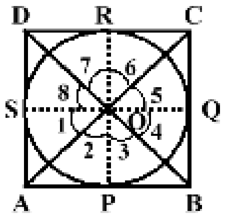
Q. No.	**(Section A- SET 1)** **Section A consists of 20 questions of 1 mark each.**		
1.	(C) no solution	**11**	(A) $62\frac{1}{2}^{0}$
2	(A) $a-b$	**12**	(C) 550 cm^2
3	(D) $(8,-13)$	**13**	(B) $\frac{9}{21}$
4	(A)$(x+1)^2 = 2x+1$	**14**	(C) $\left(\frac{13}{7},0\right)$
5	(B) 2	**15**	(D) 11
6	(D) 1	**16**	(B) 7.5 cm
7	(C) $\frac{\pi+2}{\pi}$	**17**	(D) $\sqrt{2}$ r
8	(B) 30^0	**18**	(A) -1
9	(D) $10\sqrt{2}$ units	**19**	Option (b)
10	(D) $tan^2\theta - sec^2\theta = 1$	**20**	Option (a)

	(Section – B) **Section B consists of 5 questions of 2 marks each.**		
21	$\text{cosec}\ \alpha = \frac{1}{\sin\ \alpha} = \sqrt{2}$ $\text{cosec}\ \beta = \sqrt{1+\cot^2\beta} = \sqrt{1+3} = 2$ $\therefore\ \text{cosec}\ \alpha + \text{cosec}\ \beta = \sqrt{2}+2$ or $\sqrt{2}\ (\sqrt{2}+1)$	½ 1 ½	2
22	Given, ΔABC ~ ΔDEF $\therefore \frac{AB}{DE} = \frac{BC}{EF} = \frac{CA}{DF}$ $\Rightarrow \frac{4}{6} = \frac{BC}{9} = \frac{CA}{12}$ ∴ BC = 6 cm and CA = 8 cm Perimeter of ΔABC = 4 + 6 + 8 = 18 cm	 ½ ½ + ½ ½	2
23	(a) $a = 5,\ a_n = 45,\ S_n = 400$ $\frac{n}{2}(5+45) = 400$ $\Rightarrow n = 16$ $5 + 15d = 45$ $\Rightarrow d = \frac{40}{15}$ or $\frac{8}{3}$ **(OR)** (b) S1 = a = 5 S2 = 12 a2 = 12-5 = 7 Therefore, d = 2	 ½ ½ ½ ½ ½ ½ ½ + ½	2
24	(a) Total area removed $= \frac{\angle A}{360}\pi r^2 + \frac{\angle B}{360}\pi r^2 + \frac{\angle C}{360}\pi r^2$ $= \frac{\angle A + \angle B + \angle C}{360}\pi r^2$ $= \frac{180}{360}\pi r^2$ $= \frac{180}{360} \text{ X } \frac{22}{7} \text{ X } (14)^2$ $= 308\ \text{cm}^2$ **OR**	 ½ ½ ½ ½	2

	(b) Perimeter of the sector = length of arc + 2r 16.4 = l + 2×5.2 l =16.4 – 10.4 = 6 Area of the sector = $\frac{lr}{2} = \frac{6\times5.2}{2}$ = 15.6	½ ½ 1	
25	 $\angle BPA = 90^o$ $\angle BPO = \angle PBO = 30^o$ Now $\angle POA = \angle OBP + \angle OPB$ $\angle POT = \angle POA = 60^0$ Since *OP* is radius and *PT* is tangent at *P*, *OP* = *PT* $\angle OPT = 90^o$ Now in right angle D *OPT* , $\angle PTO = 180^0 - (\angle OPT + \angle POT)$ Substituting $\angle OPT = 90^o$ and $\angle POT = 60^0$ we have $\angle PTO = 180^0 - (90^0 + 60^0)$ $= 180^0 – 150^0$ $= 30^o$ Thus $\angle PTA = \angle PTO = 30^o$	½ ½ ½ ½	2
	(Section – C) **Section C consists of 6 questions of 3 marks each.**		
26	Total number of cards = 52 Number of non face cards = 52 – 12 = 40 P(non-face cards) = $\frac{40}{52} = \frac{10}{13}$ P(a black King or a red queen) = $\frac{4}{52} = \frac{1}{13}$ P (Spade) = $\frac{13}{52} = \frac{1}{4}$	[1] [1] [1]	3
27	$(\sqrt{2}+\sqrt{3})^2 = 2+3+2\sqrt{6} = 5+2\sqrt{6}$ Let us assume, to the contrary, that $5 + 2\sqrt{6}$ is rational $\therefore 5 + 2\sqrt{6} = \frac{a}{b}$; a, b are integers, b ≠ 0 $\therefore \sqrt{6} = \frac{a-5b}{2b}$ RHS is a rational number, whereas LHS is an irrational number. ∴ Our assumption is wrong. $\Rightarrow 5 + 2\sqrt{6} = (\sqrt{2}+\sqrt{3})^2$ is an irrational number	1 ½ ½ ½ ½	3

<table>
<tr>
<td>28</td>
<td>(a) Prove that the lengths of the tangents drawn from an external point to a circle are equal.
Correct figure, given, to prove, construction --------------------- 1 ½
Proof ------------------------------- 1 ½

OR



(b)
Δ OPA $\cong$ Δ OSA 1
$\Rightarrow \angle 1 = \angle 2$ ½
Similarly, $\angle 3 = \angle 4$, $\angle 5 = \angle 6$, $\angle 7 = \angle 8$ ½
Now, $\angle 1 + \angle 2 + \angle 3 + \angle 4 + \angle 5 + \angle 6 + \angle 7 + \angle 8 = 360°$ ½
$\Rightarrow 2(\angle 1 + \angle 4 + \angle 5 + \angle 8) = 360°$
$\Rightarrow (\angle 1 + \angle 8) + (\angle 4 + \angle 5) = 180°$ ½
$\Rightarrow \angle AOD + \angle BOC = 180°$</td>
<td>3</td>
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<tr>
<td>29</td>
<td>(a)
LHS $= \frac{1+\sec A}{\sec A} = \frac{1+\frac{1}{\cos A}}{\frac{1}{\cos A}}$
$= 1 + \cos A$ 1
$= \frac{(1-\cos A)(1+\cos A)}{(1-\cos A)}$ 1
$= \frac{1-\cos^2 A}{1-\cos A}$
$= \frac{\sin^2 A}{1-\cos A}$ = RHS 1

OR

(b)
LHS $= p^2 - q^2$
$= (\cot\theta + \cos\theta)^2 - (\cot\theta - \cos\theta)^2$
$= [(\cot\theta + \cos\theta) + (\cot\theta - \cos\theta)][(\cot\theta + \cos\theta) - (\cot\theta - \cos\theta)]$ 1
$= 2\cot\theta \times 2\cos\theta = 4\cot\theta\cos\theta$ ½
RHS $= 4\sqrt{pq}$
$= 4\sqrt{(\cot\theta + \cos\theta)(\cot\theta - \cos\theta)}$
$= 4\sqrt{cot^2\theta - cos^2\theta}$ ½
$= 4\sqrt{cos^2\theta(cosec^2\theta - 1)}$ ½
$= 4\sqrt{cos^2\theta \times cot^2\theta}$
$= 4\cot\theta\cos\theta$ ½
$\therefore$ LHS = RHS</td>
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30

$p(x) = 3x^2 - 4x - 4$

Zeroes are $-\frac{2}{3}$ and 2   1

New zeroes are $\frac{4}{3}$ and 4   ½

Sum of new zeroes $= \frac{4}{3} + 4 = \frac{16}{3}$ ½

Product of new zeroes $= \frac{4}{3} \times 4 = \frac{16}{3}$ ½

Required polynomial is $x^2 - \frac{16x}{3} + \frac{16}{3}$ or $3x^2 - 16x + 16$ ½

3

31

62 x+43y=167 …(i)
43 x+62 y=148 …(ii)
Adding (i) and (ii) and simplifying,
we get x+y=3 …(iii)   1
Subtracting (ii) from (i) and simplifying,
we get x−y=1 …(iv)   1
Solving (iii) and (iv) to get x=2 and y=1   1

3

(Section – D)

Section D consists of 4 questions of 5 marks each

32

Daily Wages(in Rs.)	Number of Workers(f_i)	x_i	u_i	f_iu_i
100-120	10	110	-3	-30
120-140	15	130	-2	-30
140-160	20	150	-1	-20
160-180	22	170	0	0
180-200	18	190	1	18
200-220	12	210	2	24
220-240	13	230	3	39
Total	110			1

Table: 2

Mean daily wages $= 170 + \frac{1}{110} \times 20 =$ ₹170.19(approx.)   1

Mode $= 160 + \frac{22-20}{44-20-18} \times 20 =$ ₹ 166.67(approx.)   1 ½ + ½

5

33

(a)

Height of conical part = 13.5 – 3 = 10.5 m   ½

Slant height $= \sqrt{(14)^2 + (10.5)^2} = 17.5$ m   1

SA of tent = CSA of conical part + CSA of cylindrical part

$$= \left(\frac{22}{7} \times 14 \times 17.5\right) + \left(2 \times \frac{22}{7} \times 14 \times 3\right)$$ 2

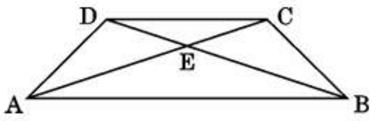
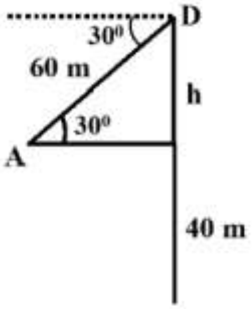
$= 1034$ m^2 ½

Cost of painting @ ₹ 2 per m^2 = 1034 × 2 = ₹ 2068   1

OR

5

	(b)		
	Height of conical part = 10.2 – 4.2 = 6 cm	½	
	Volume of toy = Volume of conical part + Volume of hemispherical part		
	$= \left(\frac{1}{3}\times\frac{22}{7}\times(4.2)^2\times 6\right)+\left(\frac{2}{3}\times\frac{22}{7}\times(4.2)^3\right)$	1	
	= 266.112	1	
	Hence, Volume of toy is 266.112 cm^3		
	Slant height of conical part = $\sqrt{(4.2)^2+(6)^2}\approx 7.32$ cm	1	
	TSA of the toy = CSA of hemispherical part + CSA of conical part		
	$= \left(2\times\frac{22}{7}\times(4.2)^2\right)+\left(\frac{22}{7}\times 4.2\times 7.32\right)$	1	
	= 207.504	½	
	Hence, TSA of toy is 207.504 cm^2		
34	(a)		5
	Let the length of shortest side be x m		
	∴ length of longest side = $(x+4)$ m	1	
	and length of third side = $(x+2)$ m		
	Now, $(x+4)^2 = x^2+(x+2)^2$	1	
	$\Rightarrow x^2-4x-12=0$		
	$\Rightarrow (x-6)(x+2)=0$		
	$\Rightarrow x=6$	1	
	∴ sides are 6 m, 8 m and 10 m	½	
	Area = $\frac{1}{2}\times 6\times 8 = 24$ m^2	½	
	Perimeter = $6+8+10=24$ m	½	
	Difference = 0	½	
	(b)		
	Let the speed in upward direction be 'x' km/h	½	
	and the speed in downward direction = (x + 10) km/h		
	ATQ		
	$\frac{150}{x}-\frac{150}{x+10}=\frac{5}{2}$	2	
	$\Rightarrow x^2+10x-600=0$	1	
	$\Rightarrow (x+30)(x-20)=0$	½	
	∴ x = 20	½	
	and x + 10 = 20 + 10 = 30	½	
	Therefore, speeds in upward and downward direction are 20 km/h and 30 km/h respectively.		

35	Given Δ AED ~ Δ BEC $\therefore \frac{AE}{BE} = \frac{DE}{CE} = \frac{AD}{BC}$ ----① Also AB ∥ DC ⇒ Δ AEB ~ Δ CED $\therefore \frac{AE}{CE} = \frac{BE}{DE}$ or $\frac{AE}{BE} = \frac{CE}{DE}$ ---- ② From ① and ②, we get $\frac{DE}{CE} = \frac{CE}{DE}$ $\Rightarrow DE^2 = CE^2 \Rightarrow DE = CE$ From ① $\frac{AD}{BC} = 1 \Rightarrow AD = BC$  	1 1 1 1 1	5
	(Section – E) **Section E consists of 3 case study-based questions of 4 marks each.**		
36	(i) $\sin 60° = \frac{\sqrt{3}}{2} = \frac{40}{OA}$ $\Rightarrow OA = \frac{80}{\sqrt{3}}$ m or $\frac{80\sqrt{3}}{3}$ m (ii) $\sin 30° = \frac{1}{2} = \frac{RC}{40}$ $\Rightarrow RC = 20$ m (iii) (a) $\tan 45° = 1 = \frac{40}{OQ}$ $\Rightarrow OQ = 40$ m Also, $\tan 60° = \sqrt{3} = \frac{40}{OP}$ $\Rightarrow OP = \frac{40}{\sqrt{3}}$ m or $\frac{40\sqrt{3}}{3}$ m $AB = PQ = \left(40 + \frac{40}{\sqrt{3}}\right)$ m or $\left(40 + \frac{40\sqrt{3}}{3}\right)$ m **OR** (b)  $\sin 30° = \frac{1}{2} = \frac{h}{60}$ $\Rightarrow h = 30$ m Height of the tower = 40 + 30 = 70 m	½ ½ ½ ½ ½ 1 ½ 1 ½ ½	4

37	Here $a = 50$ and $d = 20$		
	(i) Number of trees planted in 10th row = $a_{10} = 50 + 9 \times 20$	½	
	$= 230$	½	
	(ii) $a_8 - a_5 = 3 \times 20 = 60$	1	
	(iii) (a) Let $S_n = 3200$		
	$\Rightarrow \frac{n}{2}[2 \times 50 + (n-1) \times 20] = 3200$	½	
	$\Rightarrow n^2 + 4n - 320 = 0$	½	
	$\Rightarrow (n + 20)(n - 16) = 0$	½	
	$n \neq -20$		
	$\therefore n = 16$	½	
	Hence, required number of rows are 16		
	OR		
	(iii) (b) Required number of trees = $S_n - S_{11}$	½	
	$= 3200 - \frac{11}{2}[2 \times 50 + 10 \times 20]$	1	
	$= 1550$	½	
	Hence, number of trees left are 1550		4
38	(i) Distance between bank and hospital = $\sqrt{(-3-9)^2 + (-1-5)^2}$	½	
	$= \sqrt{180}$ units or $6\sqrt{5}$ units	½	
	(ii) Coordinates of E are $\left(\frac{9+5}{2}, \frac{5+(-5)}{2}\right) = (7,0)$	½ + ½	
	(iii) (a) Coordinates of D are $\left(\frac{-3+5}{2}, \frac{-1+(-5)}{2}\right) = (1, -3)$	1	
	Distance Partha need to cover = $\sqrt{(9-1)^2 + (5-(-3))^2}$	½	
	$= \sqrt{128}$ units or $8\sqrt{2}$ units	½	
	OR		
	(iii) (b) P is mid-point of BQ	1	
	$\therefore a = \frac{-1+3}{2} = 1$		
	Q is mid-point of PA	1	4
	$\therefore b = \frac{1+9}{2} = 5$		

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