केंद्रीय विद्यालय संगठन ,जयपुर संभाग

KENDRIYA VIDYALAYA SANGATHAN JAIPUR REGION

पूर्व -बोर्ड / Pre-Board Examination-1st : 2024-25

सेट सं /SET No :- A

कक्षा/ Class: 10 विषय /SUBJECT- MATHS BASIC (241)

	SECTION A	1
1	(c) Atmost 2	1
2	(a) k=10	1
3	(c) (0, 0)	1
4	(a) 3	1
5	(c) 2	1
6	(d)π	1
7	(b) quadratic	1
8	(d) 9π cm2	1
9	no change	1
10	(b) 4	1
11	(c) √5/2	1
12	(a) two cones and a cylinder	1
13	(b) 25	1
14	(a) 22/46	1
15	(b) 50°	1
16	(c) 45°	1
17	(d) Cyclic Quadrilateral	1
18	(A) $\frac{4}{7}$	1
19	A) Both assertion (A) and reason(R) are true and reason (R) is the correctexplanation of assertion	1
20	D)Assertion (A) is false but reason (R) is true.	1
	SECTION B	
21	Let two points be A (x_1, y_1) and B(x_2, y_2). P (x, y) divides internally the line joining A and B in the ratio m_1: m_2. Let $x_1 = -1, y_1 = 7, x_2 = 4$ and $y_2 = -3$, m = 2, n = 3 By Section formula, P (x, y) = $[(mx_2 + nx_1 / m + n) , (my_2 + ny_1 / m + n)]$ –(1) By substituting the values in the equation (1) $x = [2 \times 4 + 3 \times (-1)] / (2 + 3)$ and $y = [2 \times (-3) + 3 \times 7] / (2 + 3)$	

	x = (8 - 3) / 5 and y = (- 6 + 21) / 5 x = 5/5 = 1 and y = 15/5 = 3 Therefore, the coordinates of point P are (1, 3).	1 1
22	i)Total number of outcomes =36 The favorable outcomes are= [(2,2),(2,4),(2,6),(4,2),(4,4) ,(4,6),(6,2),(6,4),(6,6)] Total number of favorable outcomes=9 Probability of getting doublet =6/36=1/6 ii) Favourable outcome = {(1,6) (2,5) (3,4) (4,3) (5,2) (6,1)} Number of favourable outcomes = 6 Number of possible outcomes = 36 Probability = number of favourable outcomes / number of possible outcomes Probability of getting a sum of 7 = 6/36=1/6 Therefore, the probability of getting the sum of 7 on the dice is 1/6. OR Probability = Number of possible outcomes/Total number of favorable outcomes. P (E) + P (not E) = 1 Number of red balls in a bag = 5 Number of white balls in a bag = 8 Number of green balls in a bag = 4 Total number of balls = 5 + 8 + 4 = 17 (i) Probability of drawing red ball = 5/17 (ii) Probability of drawing a green ball = 4/17 Let the probability of not getting a green ball be P (not E) P (not E) = 1 - P (E) = 1 - 4/17=13/17	 1 1 1 1
23	HCF (a,b)×LCM (a, b) =a×b. 9×LCM=306×657 LCM=306 X 657/9 = 22338 LCM of 306 and 657 is 22338 OR	2

	Prime factorization of 144, 180, and 192 is (2 × 2 × 2 × 2 × 3 × 3) = $2^4 \times 3^2$, (2 × 2 × 3 × 3 × 5) = $2^2 \times 3^2 \times 5^1$, and (2 × 2 × 2 × 2 × 2 × 2 × 3) = $2^6 \times 3^1$ respectively. LCM of 144, 180, and 192= $2^6 \times 3^2 \times 5^1$ = 2880. Hence, the LCM of 144, 180, and 192 by prime factorization is 2880.	2
24	$= \frac{5\left(\frac{1}{2}\right)^2 + 4\left(\frac{2}{\sqrt{3}}\right)^2 - (1)^2}{\left(\frac{1}{2}\right)^2 + \left(\frac{\sqrt{3}}{2}\right)^2}$ $= \frac{\frac{5}{4} + 4 \times \frac{2 \times 2}{\sqrt{3} \times \sqrt{3}} - 1}{\frac{1}{4} + \frac{\sqrt{3} \times \sqrt{3}}{2 \times 2}}$ $= \frac{\frac{5}{4} + \frac{16}{3} - 1}{\frac{1}{4} + \frac{3}{4}}$ so $\frac{5cos^2 60° + 4sec^2 30° - tan^2 45°}{sin^2 30° + cos^2 30°}$ = 67/12	1 1
25	Distance Formula = $\sqrt{[(x_2 - x_1)^2 + (y_2 - y_1)^2]}$ Q (0, 1) is equidistant from P (5, - 3) and R (x, 6). So, PQ = QR $\sqrt{(5 - 0)^2 + (-3 - 1)^2} = \sqrt{(0 - x)^2 + (1 - 6)^2}$ $\sqrt{(5)^2 + (-4)^2} = \sqrt{(-x)^2 + (-5)^2}$ By squaring both the sides, 25 + 16 = x^2 + 25 x = ± 4	1 1
	SECTION C	
26	Full marks for correct proof	3

27	in ΔABC DE ‖ AC BD/AD = BE/EC ....(i) In ΔABE DF ‖ AE BD/AD = BF/FE ....(ii) BD/AD = BE/EC = BF/FE Thus, BE/EC = BF/FE OR In △ABCand △AMP In $\triangle ABC$ and $\triangle AMP$ $\angle ABC = \angle AMP$ (∵ both the angles are equal to 90°) $\angle BAC = \angle PAM$ (Each $= \angle A$) $\Rightarrow \triangle ABC \sim \triangle AMP$ (By AA similarity criteria) **Step 2: To prove the condition** $\frac{CA}{PA} = \frac{BC}{MP}$ As $\triangle ABC \sim \triangle AMP$ and corresponding sides of similar triangle are in same ratio. $\Rightarrow \frac{CA}{PA} = \frac{BC}{MP}$ Hence it is proved that $\triangle ABC \sim \triangle AMP$ and $\frac{CA}{MP} = \frac{BC}{MP}$	$1\frac{1}{2}$ $1\frac{1}{2}$ $1\frac{1}{2}$ $1\frac{1}{2}$
28	first number x. Then, the second number is x + 2 x(x + 2) = 143 $x^2 + 2x - 143 = 0$ x = 11, x = -13 11 and 13 -11 and -13	½ ½ ½ ½ ½ ½
29	Let the roots of the polynomial $2x^2 - 5x - 3$ be denoted by r_1 and r_2. According to Vieta's formulas, we have: $$r_1 + r_2 = -\frac{-5}{2} = \frac{5}{2}$$ $$r_1 r_2 = \frac{-3}{2}$$ The roots of the polynomial $x^2 + px + q$ are double the values of r_1 and r_2. Thus, we can denote the roots of $x^2 + px + q$ as $2r_1$ and $2r_2$. Using Vieta's formulas for the polynomial $x^2 + px + q$, we have: $$2r_1 + 2r_2 = -p$$ $$(2r_1)(2r_2) = q$$	1 1 $\frac{1}{2}$ ½

	1. The sum of the roots: $$2r_1 + 2r_2 = 2(r_1 + r_2) = 2 \cdot \frac{5}{2} = 5$$ Thus, we have: $$-p = 5 \implies p = -5$$ 2. The product of the roots: $$(2r_1)(2r_2) = 4(r_1 r_2) = 4 \cdot \frac{-3}{2} = -6$$ Thus, we have: $$q = -6$$ In summary, the values of p and q are: $$\boxed{-5} \text{ and } \boxed{-6}$$	
30	Correct proof	3
31	i) Length of the Arc = θ/360° × 2πr = 60°/360° × 2 × 22/7 × 21 cm = 22 cm ii)Area of the sector, AOBP = θ/360° x πr^2 = 231 cm^2 OR Area of the sea over which the ships are warned = Area of the sector. =2/9×3.14×(16.5)2 km2 = 189.97 km^2	1½ 1½
	SECTION D	
32	(a) (i)Let the present age of Nuri = x And, the present age of Sonu = y x - 3y = -10 ... (i) x - 2y = 10 ... (ii) age of Nuri = 50 years and age of Sonu = 20 years. (ii) x+y=180……(i) x−y=18……(ii) x=99,y=81 OR x + 2y = 3 ....(1) 2x - 3y = -8 ...(2) For Equation (1) x + 2y = 3 <table><tr><td>X</td><td>0</td><td>3</td></tr></table>	1 1 1 1 1 $1\frac{1}{2}$

<table>
<tr><td></td><td>
<table>
<tr><td>Y</td><td>1.5</td><td>0</td></tr>
</table>
For Equation (2) 2x - 3y = -8
<table>
<tr><td>X</td><td>0</td><td>-4</td></tr>
<tr><td>Y</td><td>2.67</td><td>0</td></tr>
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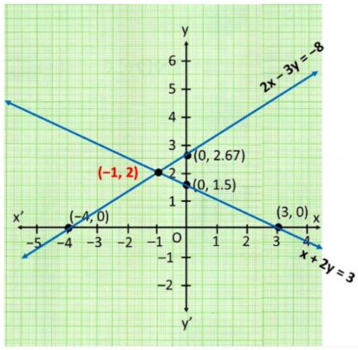
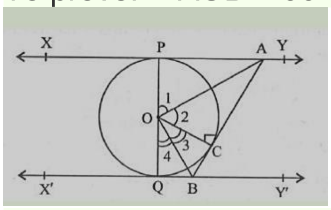


Solution x = -1 and y = 2
Area = 7 square unit
</td><td>$1\frac{1}{2}$

1

1</td></tr>
<tr><td>33</td><td>
(a) (i) correct proof
(a) (ii) correct proof

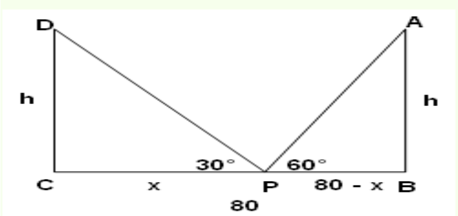
OR
Given, XY & X'Y' are parallel
To prove: ∠ AOB = 90∘ Const. : Join OC.


Proof : In △ OPA and △ OCA
∴△OPA≅△OCA(RHS Cong Rule)
Similarly, △OQB≅△OCB
∠POQ=180∘(Straightangle)
∠1+∠2+∠3+∠4=180∘

∠2+∠3=90∘ Hence, ∠AOB=90∘
</td><td>2
3

Fig
1

2

2</td></tr>
<tr><td>34</td><td>


h=x√3
h/(80–x)=√3
x=60
80–x=20
H=20√3
</td><td>Fig
1

1
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1</td></tr>
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35	Median = l + [(n/2 - cf) / f] × h	$1\frac{1}{2}$

Class Interval	Frequency	Cumulative frequency
0 - 10	5	5
10 - 20	x	5 + x
20 - 30	20	25 + x
30 - 40	15	40 + x
40 - 50	y	40 + x + y
50 - 60	5	45 + x + y

N=60

45 + x + y = 60 x + y = 15 .....(i) $1\frac{1}{2}$

28.5 = 20 + [(60/2 - (5 + x))/20] × 10

x = 8 y = 7 2

OR

Class interval	Frequency	Cumulative frequency
117.5 – 126.5	3	3
126.5 – 135.5	5	8
135.5 – 144.5	9	17 (c)
144.5 – 153.5	12 (f)	29
153.5 – 162.5	5	34
162.5 – 171.5	4	38
171.5 – 180.5	2	40
	$n = 40$	

2

$\because n = 40 \quad \therefore \frac{n}{2} = \frac{40}{2} = 20.$

Since 12 is the maximum frequency, so the median class is (144.5 – 153.5).

Here, $l = 144.5, f = 12, cf = 17$ and $h = 9$ 1

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

$$= 144.5 + \left(\frac{20 - 17}{12}\right) \times 9$$

$$= 144.5 + \frac{9}{4}$$ 1

$$= 144.5 + 2.25 = 146.75 \text{ mm.}$$

Hence, the median length of leaves is **146.75 mm**. 1

	SECTION E	
36	i) d = 200 & a = 1200 ii) t_{12} = 3400 iii) Sn = n/2 [2a + (n − 1)d S10 = 5 x 4200 = 21000 OR Sn = n/2 [2a + (n − 1)d] = 31200 n= 13	1 1 2
37	(i)- ΔABM and ΔCDM, AA Criterion. (ii) 3cm (iii) 18cm OR 60^0	1 1 2
38	(a) 4.71m^2 (b) 1.57 m^2 (c) 0.0924 m^2 OR 2.64 m^2	1 1 2