

केंद्रीय विद्यालय संगठन, जयपुर संभाग
KENDRIYA VIDYALAYA SANGATHAN JAIPUR REGION
PRACTICE PAPER : 2024-25

सेट सं / SET No. : B

कक्षा / Class : 10

विषय / SUBJECT : MATHEMATICS STANDRAD (041)

अधिकतम अंक / MM: 80

DURATION: 3 HOURS

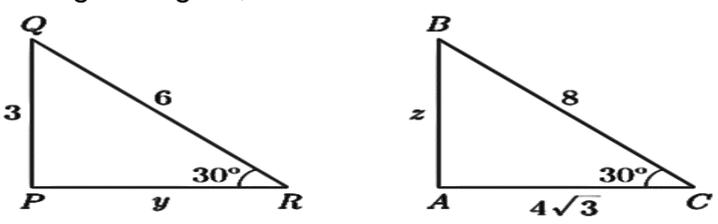
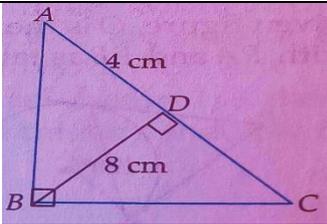
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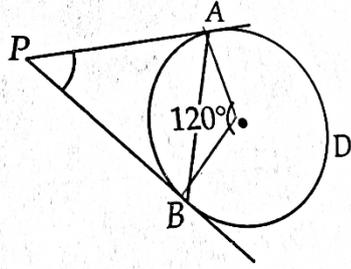
नाम Name

General Instructions:

Read the following instructions carefully and follow them:

1. This question paper contains 38 questions.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Questions no. 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion- Reason based questions of 1 mark each.
4. In Section B, Questions no. 21-25 are Very Short Answer (VSA) type questions, carrying 02 markseach.
5. In Section C, Questions no. 26-31 are Short Answer (SA) type questions, carrying 03 marks each.
6. In Section D, Questions no. 32-35 are Long Answer (LA) type questions, carrying 05 marks each.
7. In Section E, Questions no. 36-38 are case study based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. All Questions are compulsory. However, an internal choice in 2 Questions of Section B, 2 Questions of Section C and 2 Questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take $\pi = 22/7$ wherever required if not stated.
11. Use of calculators is not allowed.

S.No.	Section A	Marks
1.	Which of the following is an irrational number? (a) $5\sqrt{4}$ (b) $6 + \sqrt{5}$ (c) $\frac{\sqrt{2}}{\sqrt{8}}$ (d) $\sqrt{64} - \sqrt{16}$	1
2.	Given that HCF(96,404) is 4, then the LCM (96,404) is (a) 9187 (b) 9230 (c) 9696 (d) 10387	1
3.	If one zero of the quadratic polynomial $2x^2 - 8x - m$ is $\frac{5}{2}$ then the other zero is (a) $\frac{2}{3}$ (b) $-\frac{2}{3}$ (c) $\frac{3}{2}$ (d) $-\frac{15}{2}$	1
4.	If a pair of linear equation in two variables is inconsistent, then the lines represented by two equations are (a) Perpendicular (b) coincident (c) neither coincident nor perpendicular (d) None of the above	1
5.	If α & β are the zeroes of the polynomials $f(x) = x^2 - 5x + k$ such that $\alpha - \beta = 1$, then the value of $4k$ is (a) 12 (b) 24 (c) 10 (d) 20	1
6.	In the given figure, $\triangle ABC \sim \triangle PQR$. Find the value of $y + z$.  (a) $4\sqrt{3} + 4$ (b) $3\sqrt{2} + 4$ (c) $2\sqrt{3} + 4$ (d) $3\sqrt{3} + 4$	1
7.	In a rectangle ABCD, $AB = 40$ cm, $\angle BAC = 30^\circ$ then the side BC is (a) $\frac{40\sqrt{3}}{3}$ cm (b) $\frac{20\sqrt{3}}{3}$ cm (c) $\frac{20}{\sqrt{3}}$ cm (d) none of these	1
8.	Find the co-ordinates of the point which is reflection of point $(-3, 5)$ in x -axis. (a) $(-3, 5)$ (b) $(-3, -5)$ (c) $(3, -5)$ (d) $(3, 5)$	1
9.	If $\sqrt{3}\tan \theta = 3 \sin \theta$. Then the value of $\sin^2 \theta - \cos^2 \theta$ is (a) 3 (b) 1 (c) $\frac{1}{3}$ (d) $\sqrt{3}$	1
10.	In the given figure, $\angle ABC = 90^\circ$ and $BD \perp AC$. If $BD = 8$ cm and $AD = 4$ cm, then the value of CD is (a) 16 cm (b) 8 cm (c) 4 cm (d) 10 cm 	1
11.	The simplified value of $(1 - \cos^2 A) \operatorname{cosec}^2 A$ is (a) -1 (b) 1 (c) 0 (d) 3	1

12.	In given figure, O is the centre of circle with PA and PB as tangents. If measure of $\angle AOB = 120^\circ$, then $\triangle PAB$ is an (a) Right angle triangle (b) Equilateral triangle (c) Scalene triangle (d) None of the above		1
13.	If an arc subtends angle of 90° to the centre with radius of 35 cm, then the length of arc is (a) 52 cm (b) 50 cm (c) 65 cm (d) 55 cm		1
14.	The minute hand of a clock is 10 cm long. The area swept by the minute hand between 8:00 am to 8:20 am, is (a) 104.76 cm^2 (b) 104 cm^2 (c) 100.76 cm^2 (d) 100 cm^2		1
15.	Find the ratio between total surface area of cone and cylinder. If the height and radius of both objects are equal and radius is 7 cm and height is 24 cm. (a) 16:31 (b) 16:15 (c) 15:16 (d) 15: 31		1
16.	If the difference of mode and median of a data is 28, then the difference of median and mean is . (a) 10 (b) 12 (c) 14 (d) 16		1
17.	The mean of n observations is \bar{x} . If the first term is increased by 1, second by 2 and so on, then the new mean is (a) $\bar{x} + \frac{n+1}{2}$ (b) $\bar{x} - \frac{n+1}{2}$ (c) $\frac{n+1}{2}$ (d) none of the above		1
18.	Two dice are thrown together. Then the probability that the sum of the two numbers will be multiple of 4, is (a) $\frac{3}{4}$ (b) $\frac{1}{2}$ (c) $\frac{2}{2}$ (d) $\frac{1}{4}$		1

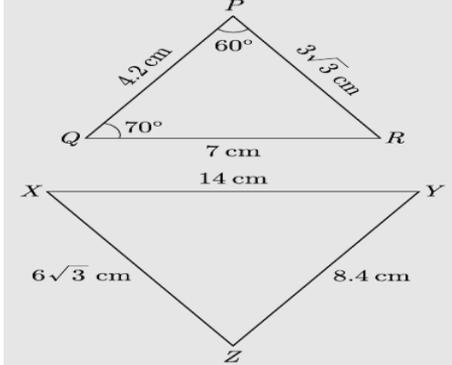
Directions for question 19 & 20 : In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as:

- (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 (c) Assertion is true but Reason is false.
 (d) Assertion is false but Reason is true.

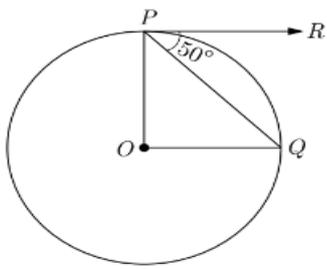
19.	Assertion: HCF of (11,17) is 1 Reason: if p and q are prime, then $\text{HCF}(p,q) = 1$	1
20.	Assertion (A): If mid point of a line joining the points (6,-3) and (a,b) is (-3,5), then a and b are -12 and 13, respectively. Reason (R): A line is obtained by joining the points (x_1,y_1) and (x_2,y_2) , then the mid point is given by $\left[\left(\frac{x_1+x_2}{2}\right), \left(\frac{y_1+y_2}{2}\right)\right]$	1

SECTION - B

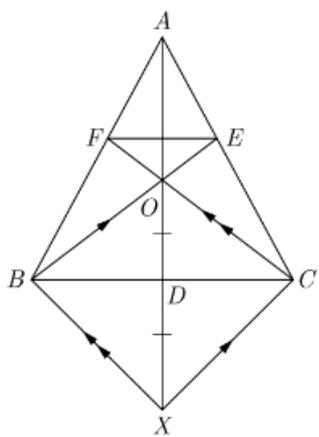
21.	If m and n are the zeroes of the polynomial $3x^2 + 11x - 4$ find the value of $\frac{m}{n} + \frac{n}{m}$.	2
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22.	Prove that $1 + \frac{\cot^2 \alpha}{1 + \operatorname{cosec} \alpha} = \operatorname{cosec} \alpha$ <p style="text-align: center;">OR</p> Prove that : $\sec^4 A - \sec^2 A = \tan^4 A + \tan^2 A$	2
23.	In the given figures, find the measure of $\angle X$. <div style="text-align: center;">  </div>	2
24.	From an external point P, tangents PA and PB are drawn to a circle with centre O. If $\angle PAB = 50^\circ$, then find $\angle AOB$.	2
25.	The perimeter of a sector of a circle with radius 6.5 cm is 31 cm, then find the area of the sector. <p style="text-align: center;">OR</p> If the difference between the circumference and the radius of a circle is 37 cm, find the circumference (in cm) of the circle. ($\pi = 22/7$)	2

SECTION - C		
26.	Given that $\sqrt{3}$ is irrational, Prove that $2 - 5(1 - \sqrt{3})$ is irrational.	3
27.	Two straight paths are represented by the equations $x - 3y = 2$ and $-2x + 6y = 5$. Check whether the paths cross each other or not. <p style="text-align: center;">OR</p> A fraction becomes $\frac{1}{3}$ when 2 is subtracted from the numerator and it becomes $\frac{1}{2}$ when 1 is subtracted from the denominator- Find the fraction.	3
28.	If α and β are zeroes of the polynomial $p(x) = 2x^2 + 3x + k$ satisfying the relation $\alpha^2 + \beta^2 + \alpha\beta = 21/4$, then find the value of k.	3
29.	Prove that: $\frac{\sin A - \cos A + 1}{\sin A + \cos A - 1} = \frac{1}{\sec A - \tan A}$	3

30.	<p>If O is centre of a circle, PQ is a chord and the tangent PR at P makes an angle of 50° with PQ, find $\angle POQ$.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">OR</p> <p>Prove that the rectangle circumscribing a circle is a square.</p>	3
31.	<p>Two dice are tossed simultaneously. Find the probability of getting</p> <p>(i) an even number on both dice.</p> <p>(ii) the sum of two numbers more than 9.</p>	3

SECTION - D

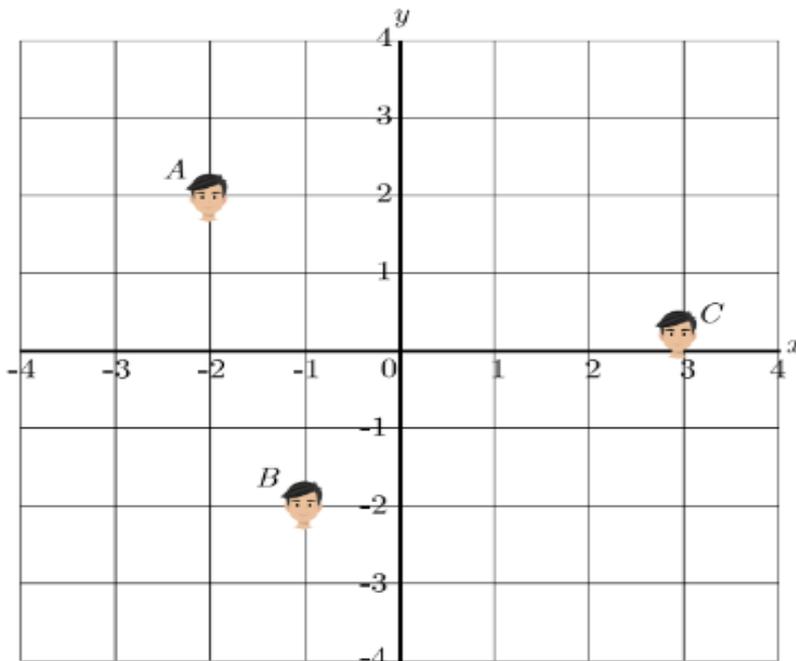
32.	<p>$\text{₹ } 9000$ were divided equally among a certain number of persons. Had there been 20 more persons each would have got $\text{₹ } 160$ less. Find the original number of persons.</p> <p style="text-align: center;">OR</p> <p>Two water taps together can fill the tank in $9\frac{3}{8}$ hrs. The tap of larger diameter takes 10 hrs less the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.</p>	5
33.	<p>In $\triangle ABC$, AD is a median and O is any point on AD. BO and CO on producing meet AC and AB at E and F respectively. Now AD is produced to X such that $OD = DX$ as shown in figure.</p> <p>Prove that :</p> <p>(1) $EF \parallel BC$</p> <p>(2) $AO:AX = AF:AB$</p> <div style="text-align: center;">  </div>	5
34.	<p>The internal and external diameters of a hollow hemispherical vessel are 16 cm and 12 cm respectively. If the cost of painting 1 cm^2 of the surface area is $\text{₹ } 5.00$, find the total cost of painting the vessel all over. (Use $\pi = 3.14$)</p> <p style="text-align: center;">OR</p> <p>Due to sudden floods, some welfare associations jointly requested the government to get 100 tents fixed immediately and offered to contribute 50% of the cost. If the lower part of each tent is of the form of a cylinder of diameter 4.2 m and height 4 m with the conical upper part of same diameter but of height 2.8 m and the canvas to be used costs $\text{Rs } 100$ per sq m. Find amount the associations</p>	5

	will have to pay. What values are shown by these associations?								
35.	The distribution below gives the marks of 100 students of a class, if the median marks are 24, find the frequencies f_1 and f_2								5
	Marks	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
	No. of students	4	6	10	f_1	25	f_2	18	5

SECTION E

(This section comprises 3 case-study/passage-based questions of 4 marks each with two sub-questions. First two case study questions have three sub questions of marks 1, 1, 2 respectively. The third case study question has two sub questions of 2 marks each.)

36. Ajay, Bhigu and Colin are fast friend since childhood. They always want to sit in a row in the classroom .But teacher doesn't allow them and rotate the seats row-wise everyday. Bhigu is very good in maths and he does distance calculation everyday. He consider the centre of class as origin and marks their position on a paper in a co-ordinate system. One day Bhigu make the following diagram of their seating position.



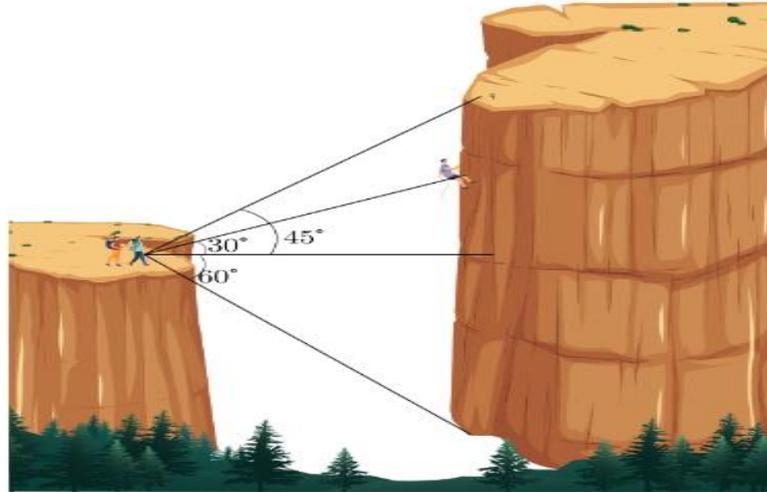
- (i) What is the distance of point A from origin ?
- (ii) What is the distance between A and B ?
- (iii)(a) What is the distance between B and C ?

OR

(b) A point D lies on the line segment between points A and B such that $AD : DB = 4 : 3$. What are the coordinates of point D ?

1
1
2

37. Height of a Climber : Himalayan Trekking Club has just hiked to the south rim of a large canyon, when they spot a climber attempting to scale the taller northern face. Knowing the distance between the sheer walls of the northern and southern faces of the canyon is approximately 150 meter, they attempt to compute the distance remaining for the climbers to reach the top of the northern rim.



Using a homemade transit, they sight an angle of depression of 60° to the bottom of the north face, and angles of elevation of 30° and 45° to the climbers and top of the northern rim respectively.

- (i) How high is the southern rim of the canyon?
- (ii) How high is the northern rim?
- (iii)(a) How much farther until the climber reaches the top?

OR

- (b) What is the difference of both the rims

1
1
2

38. India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.



1. Find the production during first year.	1
2. Find the production during 8th year.	1
3. (a) Find the production during first 3 years.	2
OR	
(b) In which year, the production is Rs 29,200.	