

POST MID TERM EXAMINATION(2017-18)SUBJECT -MATHSCLASS IX (SET- A)

TIME: 3 HRS

MM:80

GENERAL INSTRUCTIONS

- (i) All questions are compulsory
- (ii) The question paper consists of 30 questions divided into 4 sections A,B,C and D
- (iii) **Section A** consists of 6 questions of 1 mark each. **Section B** consists of 6 questions of 2 marks each. **Section C** consists of 10 questions of 3 marks each and **Section D** consists of 8 questions of 4 marks each.
- (iii) There is no overall choice ,however an internal choice has been provided in four questions of 3 marks each and three questions of 4 marks each.

SECTION A

Q1) In $\triangle ABC$, AD is the bisector of $\angle BAC$. Prove that $AB \geq BD$.



Q2) Find the value of a, for which $2x^2 + ax + \sqrt{2}$ has 1 as its zero.

Q3) Two points P and Q are equidistant from the origin. If the position of P(7,0) and the abscissa of Q is zero, find the coordinates of Q.

Q4) For what values of k, $2x + ky = 6$ has equal values of x and y for its solution?

Q5) Write the rationalising factor for $\frac{6}{\sqrt{12} - \sqrt{3}}$.

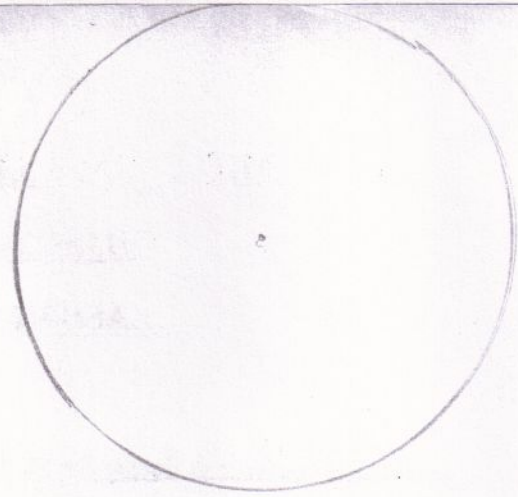
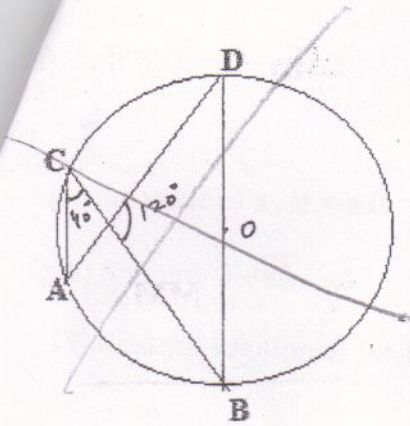
Q6) At what points does the line $3x + 4y = 6$ cuts the x-axis and the y-axis?

(2,0) (0, 1.5)

SECTION B

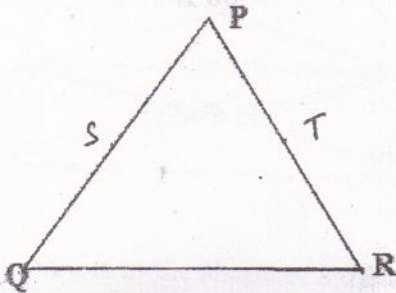
Q7) If $x = \frac{1}{2\sqrt{3}}$ is a zero of the polynomial $p(x) = 2kx^2 - 7x + k$, then find the value of k.

10



Q10) The length, breadth and height of a room are 5m, 4m and 3m respectively. Find the cost of white washing the walls of the room and the ceiling at the rate of Rs 7.50 per m^2 .

Q11) In the fig., S and T are respectively the mid points of PQ and PR. If $PQ = PR$, show that $SQ = TR$.



Q12) 1500 families with 2 children were selected randomly and the following data was recorded

No. of girls	0	1	2
No. of families	211	814	475

If a family is chosen at random, find the probability that it has

- (i) at most one girl
- (ii) at least one girl.

SECTION C

Q13) Represent $\sqrt{5}$ on the number line.

OR

Express $8.\overline{325}$ in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

Q14) Prove that the bisectors of any two consecutive angles of a parallelogram intersect at two right angles.

Q15) If $f(x) = x^3 + 3x^2 - 2x + 4$, find $f(-2) + f(2) - f(0)$.

OR

Find the value of a , if $x-a$ is a factor of $x^3 - 2ax^2 + x - a + 1$.

Q16) Simplify $3\sqrt{45} - \sqrt{125} + \sqrt{200} - \sqrt{50}$.

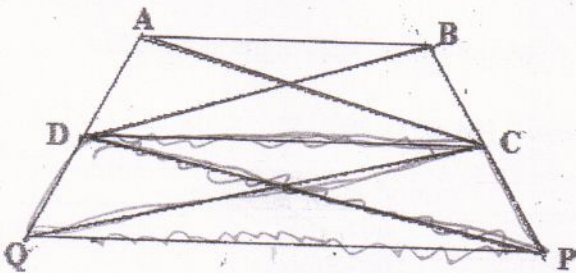
Q17) Find the solution of the linear equation $x + 2y = 8$ which represents a point on

(i) the x -axis

(ii) the y -axis

(iii) the line parallel to x -axis and at a distance of 3 units above it.

Q18) In the fig., $\text{ar}(\triangle DQC) = \text{ar}(\triangle DPC)$ and $\text{ar}(\triangle BDP) = \text{ar}(\triangle AQC)$. Show that both quadrilaterals $ABCD$ and $DCPQ$ are trapeziums.



Q19) A park is in the shape of a quadrilateral $ABCD$, has $\angle C = 90^\circ$, $AB = 9\text{ m}$, $BC = 12\text{ m}$, $CD = 5\text{ m}$ and $AD = 8\text{ m}$. How much area does it occupy?

OR

The lengths of the sides of a triangle are 7 cm , 13 cm and 12 cm . Find the length of perpendicular from the opposite vertex to the side whose length is 12 cm .

Q20) A cube of 9 cm edge is immersed completely in a rectangular vessel containing water.

If the dimensions of the base are 15 cm and 12 cm , find the rise in water level in the vessel.

Q21) Find the coordinates of the point .

(i) whose abscissa is -5 and ordinate is 4 .

(ii) whose ordinate is -7 and lies on y -axis.

(iii) whose abscissa equals the ordinate and whose distance from y -axis is 3 units in the positive direction of x -axis.

Q22) Prove that equal chords of a circle subtend equal angles at the centre.

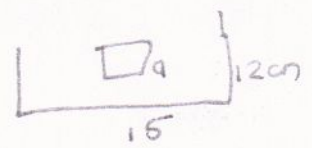
OR

Prove that angle subtended by an arc at the centre is twice the angle subtended by it on the remaining part of the circle.

$\frac{5 \times 10^6}{200} \times \frac{10^6}{200}$

$\frac{5 \times 10^6}{200}$

$\frac{12^2 + 13^2 - 7^2}{2 \times 12}$



$12^2 + 13^2 - 7^2$
 $144 + 169 - 49$
 264

$\frac{264}{2 \times 12}$

Section D

Q23) If $x = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$, $y = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, find the value of x^2+y^2+xy .

OR

Simplify $\frac{2+\sqrt{3}}{2-\sqrt{3}} - \frac{2-\sqrt{3}}{2+\sqrt{3}}$ $(2+\sqrt{3}) - (2-\sqrt{3})$
 $2-\sqrt{3} - 2-\sqrt{3} \quad (-2\sqrt{3})$

Q24) Draw the graph of $x + y = 3$ and $2x + 2y = 8$ on the same axis. What does the graph of these two lines represent?

Q25) Draw a ΔABC in which $\angle B = 45^\circ$, $\angle C = 120^\circ$ and $AB + BC + CA = 10.5$ cm

OR

Construct a triangle ABC in which $AC = 8$ cm, $\angle A = 60^\circ$ and $AB + BC = 15$ cm.

Q26) The following table gives the life times of 400 neon lamps:

Lifetime(in hours)	Number of lamps
300-400	14
400-500	56
500-600	60
600-700	86
700-800	74
800-900	62
900-1000	48

- (i) Represent the given information with the help of a histogram and a frequency polygon
 (ii) How many lamps have a lifetime of 700 or more lamps.

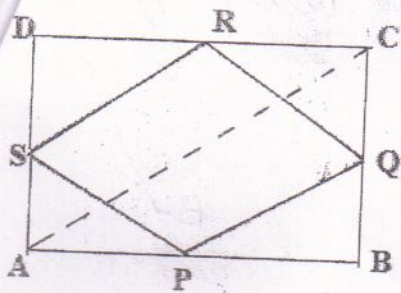
Q27) In the fig., $ABCD$ is a quadrilateral in which P, Q, R and S are mid points of the sides AB, BC, CD and DA . AC is a diagonal. Show that

(i) $SR \parallel AC$ and $SR = \frac{1}{2} AC$

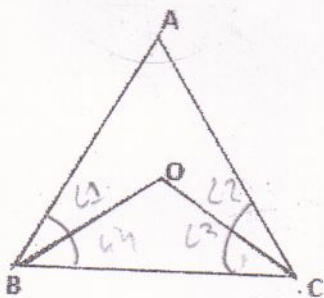
(ii) $PQ = SR$

(iii) $PQRS$ is a parallelogram.

$$\begin{array}{r} 74 \\ 62 \\ \hline 136 \\ 148 \\ \hline 284 \end{array}$$



Q28) For spreading the message Save Environment Save Future a rally was organised by some students of a school. They were given triangular cardboard pieces which they divided into two parts by drawing bisectors of base angles ($\angle B$ and $\angle C$) intersecting at O in the given fig.,. Prove that $\angle BOC = 90^\circ + \frac{1}{2} \angle A$



$$\begin{aligned} \angle A + \angle B + \angle C &= 180 \\ \angle A + \angle 1 + \angle 2 + \angle 3 + \angle 4 &= 180 \\ \angle A + \angle B + \angle C &= 180 \\ \angle A + 2\left(\frac{\angle B}{2}\right) + 2\left(\frac{\angle C}{2}\right) &= 180 \\ \angle A + \angle B + \angle C &= 180 \end{aligned}$$

Which values are depicted by these students?

Q29) A Spherical ball of radius 3 cm is melted and recast into three spherical balls. The radii of two of these balls are 1.5 cm and 2 cm. Find the radius of the third ball.

OR

A hemispherical tank is made up of an iron sheet 1 cm thick. If the inner radius is 1m, then find the volume of the iron used to make the tank.

Q30) The mean of the following distribution is 50.

x	10	30	50	70	90
f	17	5a+3	32	7a-11	19

Find the value of a and hence the frequencies of 30 and 70.

$$\begin{array}{r} 1240 \\ 68 \\ \hline 308 \end{array}$$

$$\begin{array}{r} 19 \\ 32 \\ \hline 51 \end{array}$$

240

400