TARGET MATHEMATICS
THE EXCELLENCE KEY
AGYAT GUPTA (M.Sc., M.Phil.)

25 Year of Quality Education

CODE:1812- AG-5-SA-2 REGNO:-TMC -D/79/89/36/63

GENERAL INSTRUCTIONS :

1. All questions are compulsory.
2. The question paper consists of 31 questions divided into four sections A,B,C and D. Section – A comprises of 4 question of 1 mark each. Section – B comprises of 6 questions of 2 marks each. Section – C comprises of 10 questions of 3 marks each and Section – D comprises of 11 questions of 4 marks each.
3. Use of calculator is not permitted.

MATHEMATICS CLASS X (SA- 2)

Time : 3 to $3\frac{1}{4}$ Hours Maximum Marks : 90

SECTION A

Q.1	Find the 12th term of the A.P. $\sqrt{2}, 3\sqrt{2}, 5\sqrt{2}, \ldots\ldots$
Q.2	In a AP , find the missing terms: , 38, , , , - 22 .
Q.3	Two vertices of a triangle are (1, 2), (3, 5) and its centroid is at the origin. Find the coordinates of the third vertex.
Q.4	If the perimeter of a protractor is 72 cm, calculate its area.

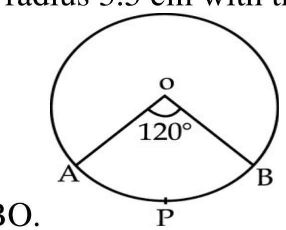
SECTION B

Q.5	The perimeter of a sector of a circle is 66 cm and the radius of circle is 12 cm. Find the corresponding length of the arc.
Q.6	If the points A(1,2), B(4,q), C(p,6) and D(3,5) are vertices of a parallelogram ABCD, find the values of p and q.
Q.7	If the p^{th} term of an A.P. is q and the q^{th} term is p, prove that its n^{th} term is (p + q - n).
Q.8	Show that points (1,-1), (5, 2) and (9,5) are collinear.

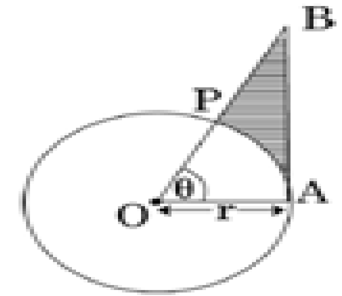
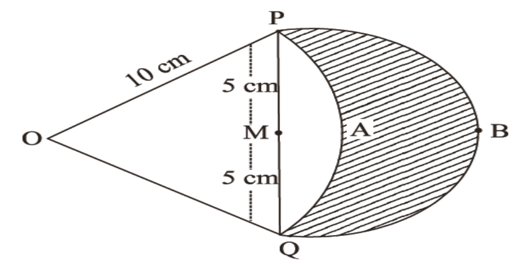
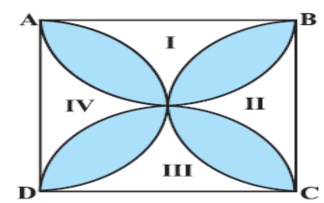
Visit us at www.agyatgupta.com

Q.9	If the points A (-2, 2) and B (x, 8) are on the circle with the centre O (2, 5), find the value of x.
Q.10	If the perimeter of a sector of a circle of radius 5.7m is 27.2m, then find the area of the sector.

SECTION C

Q.11	There is a small island in the middle of a 100 m wide river and a tall tree stands on the island. P and Q are points directly opposite to each other on two banks, and in line with the tree. If the angles of elevation of the top of the tree from P and Q are respectively 30^o and 45^o, find the height of the tree.
Q.12	In the figure OAPB is a sector of a circle of radius 3.5 cm with the centre at O and $\angle AOB = 120^0$. Find the length of OAPBO. 
Q.13	Prove that the area of triangle with vertices (t , t-2);(t+2, t +2) & (t+3, t) is in depended of t . Also find its area .
Q.14	Which term of the sequence 20, $19\frac{1}{2}, 18\frac{1}{2}, 17\frac{3}{4}$ is the 1st negative term.
Q.15	The line segment joining the points A (3,-4) and B (1,2) is trisected at the point P and Q . If the co-ordinate of p and q are (p,-2) and $\left(\frac{5}{3}, q\right)$ where P nearer to A and Q nearer to B Find the values of p and q .
Q.16	Two poles of equal heights are standing opposite each other on either side of a road, which is 80 m wide. From a point between them on the road, the angles of elevation of the top of the poles are 60° and 30°, respectively. Find the height of the poles and the distance of the point from the poles.
Q.17	Solve for x: $\sqrt{2x+9} + x = 13$.
Q.18	The sum of three number in A.P. is -3 and their product is 8. Find the

	numbers.
Q.19	Find the coordinates of the circum centre of the triangle whose vertices are (3, 0), (– 1, – 6) and (4, – 1). Also, find its circum radius.
Q.20	The ratio of the sum of m and n of an A.P. is $m^2 : n^2$. Show that the ratio of the mth and nth terms is (2m-1): (2n-1) .
	SECTION D
Q.21	A ladder rests against a wall at the angle α to the horizontal . When its foot is pulled away from the wall through a distance a, it slides a distance b down the wall and makes an angle β with the horizontal. Show that $\frac{a}{b} = \frac{\cos\beta - \cos\alpha}{\sin\alpha - \sin\beta}$.
Q.22	The sum of the first, p, q, r terms of an A.P. area a, b, c respectively. Show that $\frac{a}{p}(q-r) + \frac{b}{q}(r-p) + \frac{c}{r}(p-q) = 0$.
Q.23	The base BC of an equilateral triangle ABC lies y-axis .the co-ordinates of the points c are (0,-3) if the origin is the mid- point of the base B, find the co-ordinate of the points A and B and hence find the area of the Δ ABC.
Q.24	The short and long hands of a clock are 4 cm and 6cm long respectively. Find the sum of of the distances traveled by their tips in two days. Take $\left(\pi = \frac{22}{7}\right)$
Q.25	Rs. 9000 were divider equally among a certain number of persons. Had there been 20 more persons, each would have got rs. 160 less. Find the original number of persons.
Q.26	If the three vertices of a parallelogram A(6,1), B(8,2), C(9,4) . E is the mid point of CD . Find the area of triangle AED .
Q.27	From the top of a building 60 m high, the angles of depression of the top and bottom of a vertical lamp post are observed to be 30° and 60 °respectively, Find the height of the lamp post.
Q.28	In given fig is shown a sector OAP of a circle with center O containing $\angle\theta$. AB is perpendicular to the radius OA and meets OP produced at B . Prove that the perimeter of the shaded region is

	 $r\left[\tan\theta + \sec\theta + \frac{\pi\theta}{180} - 1\right]$.
Q.29	In given fig. two arcs PAQ and PBQ . Arc PAQ is a part of circle with center O and radius OP while arc PBQ is a semi circle drawn are PQ as diameter with center M. If OP = PQ= 10 cm prove that the area of the shaded region is  $25\left(\sqrt{3} - \frac{\pi}{6}\right) cm^2$.
Q.30	Find the area of the shaded design in Fig. 12.17, where ABCD is a square of side 10 cm and semicircles are drawn with each side of the square as diameter.  (Use π = 3.14) .
Q.31	The angle of elevation of a jet fighter from point A on ground is 60° After a flight of 10 seconds, the angle changes to 30°. If the jet is flying at a speed of 648 km/hour, find the constant height at which the jet is flying.
	*************
	" STAY FOCUSED AND NEVER GIVE UP "