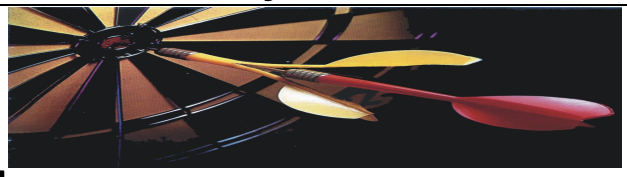


Year of Quality education 18th

Code No. **Series AG-F1** **TMG-D/79/89**

- Please check that this question paper contains 3 printed pages.
- Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains 30 questions.

General Instructions: -

1. All questions are compulsory.
2. The question paper consists of 30 questions divided into three sections A, B ,C and D . Section A contains 10 questions of 1 marks each, Section B is of 5 questions of 2 marks each, Section C is of 10 questions of 3 marks each and Section D is of 5questions of 6 marks each.
3. Write the serial number of the question before attempting it.
4. If you wish to answer any question already answered, cancel the previous answer.
5. In questions where internal choices is provided. You must attempt only one choice.

Pre-Board Examination 2009 -10

Time: 3 hrs. ***M.M.: 80***

CLASS – X MATHEMATICS

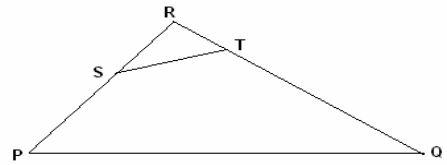
Section A

Q.1 In right triangle ABC, right-angled at B, if tan A=1, write the value of sin A cos A.

Q.2 An arc of a circle is of length 6π and the sector it bounds has an area $30\pi cm^2$. Find the radius of the circle.

Q.3 From a well shuffled pack of 52 cards, one card is drawn at random. Find the probability that it is neither king nor club.

Q.4 In the fig if $\angle P = \angle RTS$, prove that $\Delta RPQ \sim \Delta RTS$.



Q.5 For what value of k, the following pair of linear equations has infinitely many solutions. 10x+5y-(k-5) = 0 ; 20 x + 10y- k = 0 .

Q.6 Find the values of x for which the distance between the point. P(2,-3) and Q(x,5) is 10 units.

Q.7 Determine k so that $\frac{2}{3}$, k and $\frac{5}{8}k$ are the three consecutive terms of an A.P.

Q.8 What is the median class for the following grouped data?

Class	128-135	135-142	142-149	149-156	156-163	163-170
Frequency	8	5	9	12	5	1

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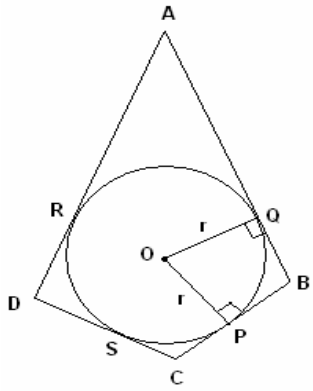
PREMIER INSTITUTE for X , XI & XII .

Q.9	If the points (a, 0), (0, b) and (1, 1) are collinear, find the value of $\frac{1}{a} + \frac{1}{b}$.
Q.10	For what value of k, are the roots of the quadratic equation $kx^2 + 4x + 1 = 0$ equal and real?
	Section B
Q.11	If two zeroes of the polynomial $x^4+3x^3-20x^2-6x+36$ are $\sqrt{2}$ and $-\sqrt{2}$. Find the other zeroes of the polynomial.
Q.12	Using Euclid's division algorithm find the H.C.F of 56, 96 and 404. **Or** Prove that $(3-\sqrt{5})$ is an irrational number.
Q.13	A piggy bank contains hundred 50 paise coins, fifty Rs. 1 coins, twenty Rs. 2 coins and ten Rs. 5 coins. If it is equally likely that one of the coins will fall out when the bank is turned upside down, what is the probability that the coin: (i) will be 50 paise coin? (ii) will not be a Rs. 5 coin?
Q.14	Find the area of Quadrilateral ABCD whose vertices are A(-5,-3) B (-4,-6) C(2,-1) and D(1,2) .
Q.15	1 and – 3 are the zeros of the polynomials $x^3 - ax^2 - 13x + b$, find the values of a and b.
	Section C
Q.16	If the 8^{th} term of an A.P. is 37 and the 15^{th} term is 15 more than the 12^{th} term, find the A.P. Hence find the sum of the first 15 terms of the A.P.
Q.17	Construct a ΔABC in which CA=6cm, AB=5cm and $\angle BAC=45^0$, then construct a triangle similar to the given triangle whose sides are $\frac{6}{5}$ of the corresponding sides of the ΔABC (Write steps of Construction).
Q.19	(i)The mid-points of the sides of a triangle are (3, 4) (4, 1) and (2, 0). Find the coordinates of the vertices of the triangle. (ii)The line joining the points (2, 1) and (5, - 8) is trisected at the points P and Q. If the point p lies on the line 2x – y + k = 0, find the value of k.
Q.18	Solve the system of linear equations graphically: x + y = 4; 3x – 2y = - 3 Shade the region bounded by the lines representing the above equations and x - axis.
Q.19	In the given figure, a circle is inscribed in a quadrilateral ABCD in which angle $B=90^0$. If AD=23 cm, AB=29 cm and DS=5 cm, find the radius of the circle. 
Q.20	An oil funnel made of tin sheet consists of a 10 cm long cylindrical portion attached to a frustum of a cone. If the total height is 22 cm, diameter of the cylindrical portion is 8 cm and the diameter of the top of the funnel is 18 cm, find the area of the tin sheet required to make the funnel.

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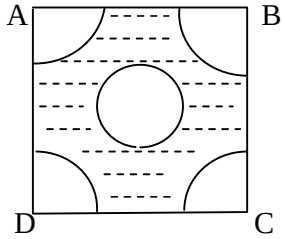
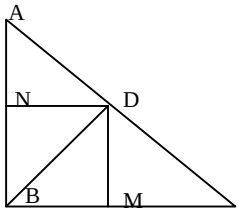
Q.21 From each corner of a square of side 4cm a quadrant of a circle of radius 1 cm is cut and also a circle of diameter 2cm is cut as shown in fig. Find the area of the remaining portion of the square.



or

The decorative block is made of two solids- a cube and a hemisphere. The base of the block is a cube with edge 5cm, and the hemisphere fixed on the top has Diameter of 4.2 cm. Find the total surface area of the block.

Q.22



In the figure ABC is a right triangle right angled at B and D is the foot of the perpendicular drawn from B on AC. If DM ⊥ BC and DN ⊥ AB, prove that DM^2 = DN. MC .

Or

ΔABC is a triangle and AD, BE and CF are its medians. Prove that 3(sum of the squares of its sides) = 4 (sum of the squares of its medians).

Q.23 The area of a rectangle remains the same if the length is increased by 7m and the breadth is decreased by 3m. The area remains unaffected if the length is decreased by 7m and breadth is increased by 5m. Find the dimensions of the rectangle.

Q.24 Spherical marbles of diameter 1.4 cm each are dropped into a cylindrical beaker of radius 3.5 cm containing some water. Find the number of marbles that should be dropped in the beaker so that the water level in the beaker rises by 5.6 cm.

Or

A bucket is in the form of a frustum of a cone and holds 28. 49 litres of milk. The radii of the top and bottom are 28 cm and 21 cm respectively. Find the height of the bucket.

Q.25 Prove that the parallelogram circumscribing a circle is a rhombus.

Section D

Q.26 The following table shows the marks obtained by 100 students of class x in a school during a particular academic session. Find the mean and mode of this distribution

Marks	No. of students.
Less than 10	7
Less than 20	21
Less than 30	34

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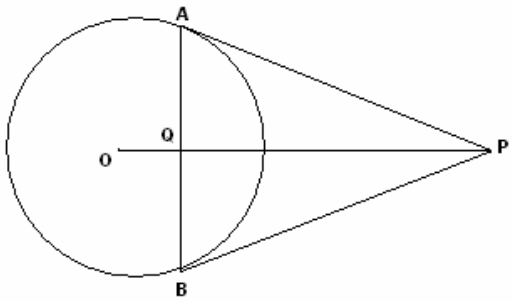
	Less than 40	46
	Less than 50	66
	Less than 60	77
	Less than 70	92
	Less than 80	100

Q.27 Prove that the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

Using the above theorem, prove that two similar triangles are congruent if their areas are equal.

or

Prove that the lengths of tangents drawn from an external point to a circle are equal.
Making use of the above, prove the following:
From an external point P, two tangents PA and PB are drawn to a circle with centre O as shown in figure. Show that OP is the perpendicular bisector of AB.



Q.28 From a point 100 m above a lake, the angle of elevation of stationary helicopter is 30^0 and angle of depression of the helicopter in the lake is 60^0. Find the height of helicopter.

or

The angle of elevation of an aeroplane from a point on the ground is 60^0. After a flight of 15 seconds, the angle of elevation changes to 30^0. If the helicopter is flying at a constant height of $1500\sqrt{3}$ m, find the speed of aeroplane.

Q.29 A person on tour has Rs 4,200 for his expenses. If he extends his tour for 3 days, he has to cut down his daily expenses by Rs 70. Find the original duration of the tour.

Q.30 The interior of building is in the form of a right circular cylinder of radius 7m and height 6m, surmounted by right circular cone of same radius and of vertical angle 60^0. Find the cost of painting the building from inside at the rate of Rs. 30 per m^2 .

********** _____ **********

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