ACHIEVERS FOUNDATION

ICSE Board
Class IX Mathematics
Paper 1

Time: 2½ hrs **Total Marks: 80**

General Instructions:

1. Answers to this paper must be written on the paper provided separately.
2. You will **NOT** be allowed to write during the first 15 minutes. This time is to be spent in reading the question paper.
3. The time given at the head of this paper is the time allowed for writing the answers.
4. This question paper is divided into two Sections. Attempt **all** questions from **Section A** and any **four** questions from **Section B**.
5. Intended marks for questions or parts of questions are given in brackets along the questions.
6. All working, including rough work, must be clearly shown and should be done on the same sheet as the rest of the answer. Omission of essential working will result in loss of marks
7. Mathematical tables are provided.

SECTION – A (40 Marks)

*(Answer **all questions** from this Section)*

Q. 1.

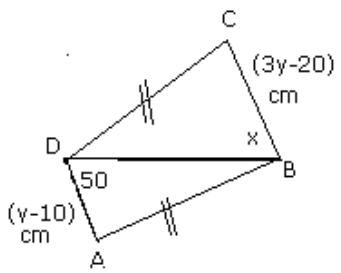
(a) The compound interest on a certain sum of money at 5% p.a. for 2 years is Rs. 287. Find the sum. [3]

(b) Show that $\sqrt{2}$ is an irrational number. [3]

(c) Evaluate: $\dfrac{\cos 37^{\circ}.\cos ec 53^{\circ}}{\tan 5^{\circ}.\tan 25^{\circ}.\tan 45^{\circ}.\tan 65^{\circ}.\tan 85^{\circ}}$ [4]

Q. 2.

(a) Use congruency of triangles to find the value of x and y. [3]



(b) Express $2\log 3 - \frac{1}{2}\log 16 + \log 12$, as a single logarithm. [3]

(c) Draw parallelogram ABCD with AB = 6 cm, AD = 5 cm and $\angle DAB = 45^{o}$. [4]

Join diagonals AC and BD. Let them intersect at O.

Q. 3.

(a) Evaluate: $\left(\frac{8}{27}\right)^{-\frac{2}{3}} - \left(\frac{1}{3}\right)^{-2} - (7)^{0}$ [3]

(b) Find the value of 'a' and 'b' if (2a + b, a – 2b) = (7, 6) [3]

(c) Show that a quadrilateral with vertices (0, 0), (5, 0), (8, 4) and (3, 4) is a rhombus. Also find its area. [4]

Q. 4.

(a) Using Pythagoras theorem, prove that the area of an equilateral triangle of side 'a' is $\frac{\sqrt{3}}{4} \times a^{2}$. [3]

(b) The difference between the exterior angle of a regular polygon of n sides and a regular polygon of (n + 2) sides is 6. Find the number of sides. [4]

(c) Evaluate $\frac{4}{\tan^{2} 60^{\circ}} + \frac{1}{\cos^{2} 30^{\circ}} - \tan^{2} 45^{\circ}$ [3]

SECTION – B (40 Marks)

*(Answer **any four questions** from this Section)*

Q. 5.

(a) Graphically solve the following equations: [4]

3x – 5y + 1 = 0; 2x – y + 3 = 0 [Use 1 cm = 1 unit on both the axes]

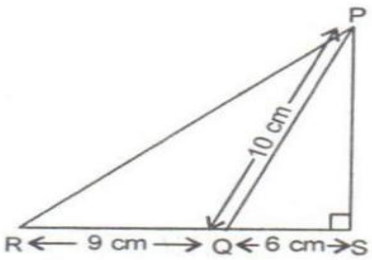
(b) A man starts his job with a certain monthly salary and earns a fixed increment every year. If his salary was Rs. 1500 after 4 years of service and Rs. 1800 after 10 years of his service, what was his starting salary and what is the annual increment? [3]

(c) If $x = \frac{1}{\sqrt{2}-1}$, then prove that $x^{2} - 6 + \frac{1}{x^{2}} = 0$ [3]

Q. 6.

(a) What sum of money will amount to Rs. 3630 in two years at 10% p.a. compound interest? [3]

(b) In the given figure, m∠PSR = 90°, PQ = 10 cm, QS = 6 cm, RQ = 9 cm. Calculate the length of PR. [3]



(c) The lengths of two parallel chords of a circle are 6 cm and 8 cm. If the smaller chord is at a distance 4 cm from the centre, what is the distance of the other chord from the centre? [4]

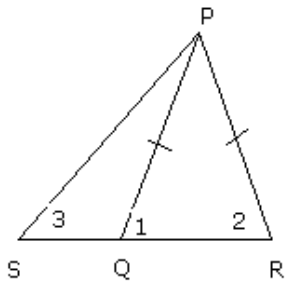
Q. 7.

(a) Calculate the mean and median of the following data: [3]

3, 1, 5, 6, 3, 4, 5, 3, 7, 2

(b) A room is 8 m long and 5 m broad. Find the cost of covering the floor of the room with 80 cm wide carpet at the rate of Rs. 22.50 per metre. [3]

(c) In the figure, Q is a point on side of ΔPSR such that PQ = PR. Prove that PS > PQ. [4]



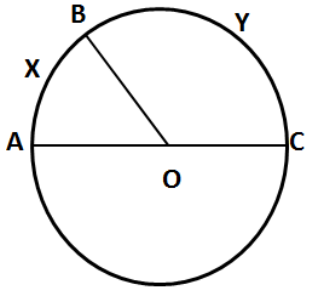
Q. 8.

(a) A small indoor greenhouse (herbarium) is made entirely of glass panes (including the base) held together with tape. It is 30 cm long, 25 cm wide and 25 cm high. [4]

i. What is the area of the glass?

ii. How much of tape is needed for all the 12 edges?

(b) In the given figure, AOC is the diameter of the circle, with centre O. If arc AXB is half of arc BYC, find ∠BOC. [3]



(c) The ages (in years) of 360 patients treated in a hospital on a particular day are given below. [3]

Age in years	10-20	20-30	30-40	40-50	50-60	60-70
Number of patients	90	40	60	20	120	30

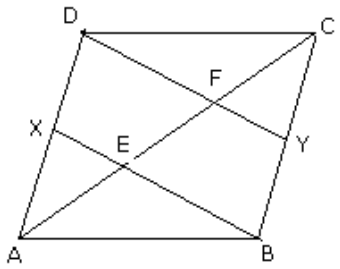
Draw a histogram and a frequency polygon on the same graph to represent the above data.

Q. 9.

(a) If $2\cos^2\theta \sin\theta - 2 = 0$ and $0° \le \theta \le 90°$; find the value of θ. [3]

(b) If $p^{\frac{1}{x}} = p^{\frac{1}{y}} = p^{\frac{1}{z}}$ and pqr = 1, prove that x + y + z = 0 [3]

(c) In the given figure, ABCD is a parallelogram in which X and Y are the midpoints of AD and BC respectively, Prove that: AE = EF = FC. [4]



Q. 10.

(a) If $\frac{2\sqrt{7}+3\sqrt{5}}{\sqrt{7}+\sqrt{5}} = P\sqrt{35}+Q$, then what is the value of 2P + Q? [3]

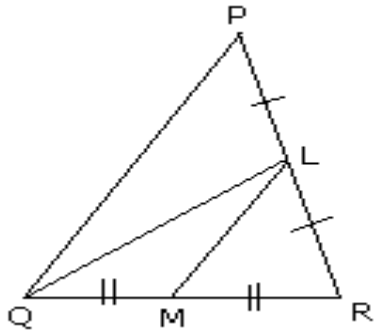
(b) Given 3 cos A – 4 sin A = 0; evaluate without using tables: $\frac{\sin A + 2\cos A}{3\cos A - \sin A}$ [4]

(c) If $a+\frac{1}{a}=4$, find the value of i. $a^2+\frac{1}{a^2}$ ii. $a^4+\frac{1}{a^4}$ [3]

Q. 11.

(a) Show that a median divides a triangle into two triangles of equal areas. [4]

(b) In the given figure, area of $\Delta PQR = 44.8\ cm^2$, PL = LR and QM = MR. Find the area of ΔLMR. [3]



(c) Factorize: $x^3 - 3x^2 - x + 3$ [3]