ICSE Class 10 Maths Sample Paper 2

MATHEMATICS

(Two hours and a half)

Attempt all questions from **Section A** and any **four** questions from **Section B.**
All working, including rough work, must be clearly shown and must be done on the same sheet as the rest of the answer. Omission of essential working will result in the loss of marks.
Mathematical tables are provided.

Section A (40 Marks)

Attempt **all** questions from this section

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1. (a) A shopkeeper buys an article at a discount of 25% from the wholesaler. The printed price of the article is Rs 5000 and the rate of sales tax is 10%. The shopkeeper sells it to the customer at a discount of 5% of the printed price and charges the sales tax at the same rate. Find :

(i) the amount paid by the customer

(ii) the VAT (Value Added Tax) paid by the shopkeeper. [4]

(b) Find the remainder when $2x^3 - 3x^2 + 7x - 8$ is divided by $x - 1$. [3]

(c) Find the value of : cosec $(65° + \theta)$ – sec $(25° - \theta)$. [3]

2. (a) Manoj opened a recurring deposit account with Punjab National Bank and deposited Rs 500 per month for 3 years. The bank paid him Rs 20220 on maturity. Find the rate of interest paid by the bank. [3]

(b) A solid consisting of a right circular cone, standing on a hemisphere, is placed upright in a right circular cylinder full of water and touches the bottom. Find the volume of water left in the cylinder having given that the radius of the cylinder is 3 cm and its height is 6 cm, the radius of the hemisphere is 2 cm and the height of the cone is 4 cm. Give your answer to nearest cubic centimetre. [4]

(c) The volume and curved surface of a cylinder are equal numerically. If the height is $3\frac{1}{2}$ times the radius of the base, find the radius. [3]

3. (a) Solve the inequation :

$$12 + 1\frac{5}{6}x \leq 5 + 3x,\ x \in R$$

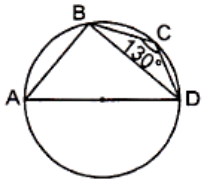
Represent the solution on a number line. [4]

(b) Using factor theorem show that $(x - 3)$ is a factor of $x^3 - 7x^2 + 15x - 9$. Hence, factorise the given expression completely. [3]

(c) Find the 2×2 matrix X which satisfies the equation

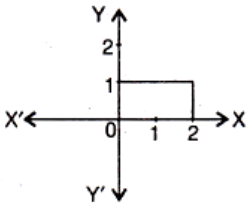
$$\begin{bmatrix} 3 & 7 \\ 2 & 4 \end{bmatrix}\begin{bmatrix} 0 & 2 \\ 5 & 3 \end{bmatrix} + 2X = \begin{bmatrix} 1 & -5 \\ -4 & 6 \end{bmatrix}$$ [3]

4. (a) In the figure, AD is the diameter of the circle. If $\angle BCD = 130°$, calculate : (i) $\angle DAB$ (ii) $\angle ADB$ [3]



(b) Part of a geometrical figure is given in the diagram alongside.

Complete the figure so that both the x-axis and y-axis are lines of symmetry of the completed figure. [3]



(c) Calculate the mean wage correct to the nearest rupee for the following data :

Category	A	B	C	D	E	F	G
Wages in Rs per day	50	60	70	80	90	100	110
No. of workers	2	4	8	12	10	6	8

[4]

Section B (40 Marks)

Attempt **any four** questions from this section

5. (a) Use graph paper for this question.

(i) Plot the points A (3, 5) and B (–2, – 4). Use 1 cm = 1 unit on both the axes.

(ii) A′ is the image of A when reflected in the x-axis. Write down the coordinates of A′ and plot it on the graph paper.

(iii) B′ is the image of B when reflected in the y-axis followed by reflection in the origin. Write down the coordinates of B′ and plot it on the graph paper.

(iv) Write down the geometrical name of the figure AA′BB′. [4]

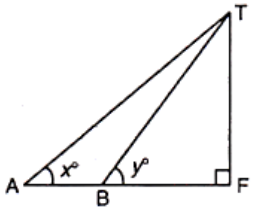
(b) Solve using quadratic formula : $6x^2 + (12 - 8a)\,x - 16a = 0$ [3]

(c) Deepika opened a savings bank account in a bank. Her passbook entries are shown below :

Date	Particulars	Withdrawals Rs	Deposits Rs	Balance Rs
Jan 1	B/F	—	—	6360
Jan 12	By cash	—	750	7110
Feb 15	To self	5000	—	2110
June 6	To cheque	354	—	1756
July 18	By cheque	—	543	2299

She closed the account on 29 July and received Rs 2354.20 as balance. Calculate the rate of interest. [3]

6. (a) In the figure, not drawn to scale, TF is a tower. The elevation of T from A is $x°$, where $\tan x = \frac{2}{5}$ and AF = 200 m. The elevation of T from B, where AB = 80 m, is $y°$. Calculate :



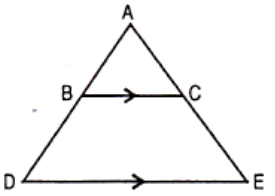
(i) the height of the tower TF.

(ii) the angle y, correct to nearest degree. [4]

(b) Construct a triangle ABC in which BC = 6 cm, AB = 9 cm, and ∠ABC = 60°. Construct the locus of all points inside triangle ABC, which are equidistant from B and C. [3]

(c) The compound interest, calculated yearly on a certain sum of money for the second year is Rs 880 and for the third year it is Rs 968. Calculate the rate of interest and the sum of money. [3]

7. (a) In the figure, BC is parallel to DE. Area of triangle ABC = 25 cm^2, area of trapezium BCED = 24 cm^2, DE = 14 cm. Calculate the length of BC. [4]



(b) A bag contains 8 red, 6 white and 4 black balls. A ball is drawn at random from the bag. Find the probability that the drawn ball is :

(i) red or white (ii) not black (iii) neither white nor black. [3]

(c) A can do a piece of work in x days and B can do it in $(x + 16)$ days. If both working together can do it in 15 days, find x. [3]

8. (a) A man invests Rs 8800 on buying shares of face value of Rs 100 each at a premium of 10% in a company. If he earns Rs 1200 at the end of the year as dividend, find :

(i) the number of shares he has in the company,

(ii) the dividend percentage per share. [4]

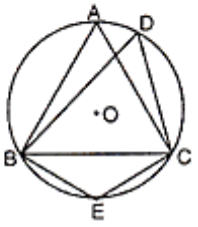
(b) Using ruler and compasses only, construct an isosceles ΔABC having base = 4 cm, vertical angle = 45° and median through vertex equal to 2.8 cm. Draw the incircle of the triangle. [3]

(c) Using the properties of proportion, solve for x : $\frac{\sqrt{a+x}+\sqrt{a-x}}{\sqrt{a+x}-\sqrt{a-x}} = b$ [3]

9. (a) A bucket is raised from a well by means of a rope which is wound round a wheel of diameter 77 cm. Given that the bucket ascends in 1 min 28 sec with a uniform speed of 1.1 m/sec; calculate the number of complete revolutions the wheel makes in raising the bucket. Take $\pi = \frac{22}{7}$. [4]

(b) Show that the points A(1, 0), B(5, 3), C(2, 7) and D (–2, 4) are the vertices of a square. [3]

(c) In the figure, O is the centre of the circle and ΔABC is equilateral. Find (i) $\angle BDC$ (ii) $\angle BEC$. [3]



10. (a) Prove the following identity :

$$\frac{1}{\sin\theta + \cos\theta} + \frac{1}{\sin\theta - \cos\theta} = \frac{2\sin\theta}{1 - 2\cos^2\theta}$$ [4]

(b) The following table shows the distribution of the heights of a group of factory workers :

Height (in cm)	150-155	155-160	160-165	165-170	170-175	175-180	180-185
No. of workers	6	12	18	20	13	8	6

(i) Determine the cumulative frequencies.

(ii) Draw the cumulative frequency curve on a graph paper. [6]

11. (a) Find the equation of the line passing through (–2, – 4) and perpendicular to the line $3x - y + 5 = 0$. [4]

(b) PAT is a tangent to the circumcircle of ΔABC such that PT ∥ BC. Show that AB = AC. [3]

(c) A dice is thrown once. What is the probability that the number obtained is : [3]

(i) even? (ii) other than 4.?