Tender Heart High School, Sector 33B, Chd.

Class : 10th
Subject : Mathematies

Date : 2.12.2024

Teacher : Ms. Reena

General Instructions :-

1) All working, including rough work, must be clearly shown and must be done on the same sheet as the rest of the answer.
2) Omission of essential working (including formula) will result in the loss of marks.
3) The intended marks for questions or parts of questions are given in brackets [ ].
4) The question paper consists of 12 questions divided into 2 sections A and B 40 marks each.

Practice Paper 1

SECTION - A (40 marks)

(Attempt any four questions from this section)

Question 1

(a) Find the values of x which satisfy the inequation $2x - 5 \leq 5x + 4 < 11$, where $x \in I$. Represent it on the number line. [3m]

(b) If $2\begin{bmatrix} 3 & 4 \\ 5 & x \end{bmatrix} + \begin{bmatrix} 1 & y \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 7 & 0 \\ 10 & 5 \end{bmatrix}$, find the values of x and y. [3m]

(c) Using factor theorem, show that $(x+4)$ is a factor of $(2x^3+9x^2+x-12)$. Hence, factorise the given expression completely. [4m]

Question 2

(a) The sum of the 5th and 9th terms of an A.P. is 26 and the sum of its 7th and 11th terms is 42. Find the first three terms of the A.P. [3m]

(b) Using the properties of proportion, find the value of x, when $\frac{x^4+1}{2x^2} = \frac{17}{8}$ [3m]

(c) Use graph paper and take 1cm = 1 unit along both x-axis and y-axis

(i) Plot the points A (-2, 2) and B(4, 4)

(ii) Reflect A and B in the origin to get A' and B' respectively.

(iii) Write down the co-ordinates of A' and B'

(iv) Give the geometrical name for the figure ABA'B'. [4m]

Question 3

(a) In what ratio does the point (-3, 7) divide the join of A (-5, 11) and B (4, -7) ? [3m]

(b) Prove that $\frac{\sin\theta \tan\theta}{1-\cos\theta} = 1+\sec\theta$ [3m]

(c) ₹ 480 is divided equally among x children. If the number of children were 20 more, then each would have got ₹ 12 less. Find the value of x. [4m]

Class X Mathematics

Question 4

(a) If a, b, c, d are in continued proportion, prove that $\frac{a^3+b^3+c^3}{b^3+c^3+d^3} = \frac{a}{d}$ [3M]

(b) Three consecutive vertices of a parallelogram ABCD are A (10, -6), B (2, -6) and C (-4, -2), find the fourth vertex D. [3M]

(c) If $P = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$ and $Q = \begin{bmatrix} 1 & 0 \\ 2 & 1 \end{bmatrix}$, compute [4M]

$P^2 - Q^2$

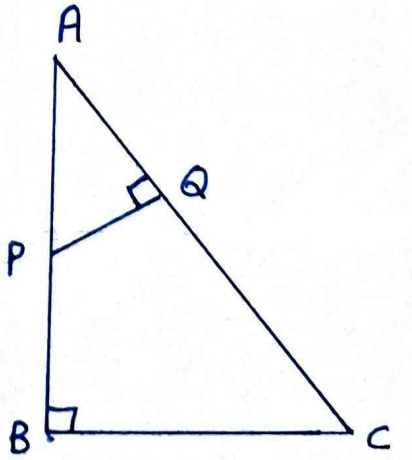
Question 5

(a) Solve the equation $3x^2 - 4\sqrt{3}x + 4 = 0$

Write your answer correct to 2 decimal places. [3M]

(b) Shobana has a cumulative time deposit account in state Bank of India. She deposits ₹500 per month for a period of 4 years. If at the time of maturity she gets ₹28410, find the rate of interest. [3M]

(c) In ΔABC, AB = 8cm, AC = 10cm and $\angle B = 90°$. P and Q are points on the sides AB and AC respectively such that PQ = 2cm and $\angle PQA = 90°$, find



(i) the area of ΔAQP

(ii) area of quad. PBCQ : area of ΔABC [4M]

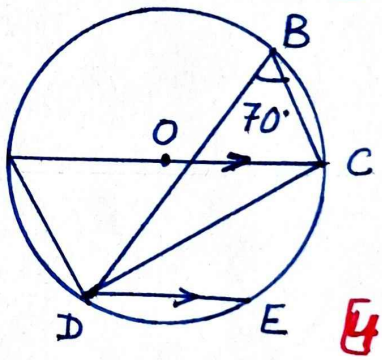
Class 10, Mathematics

Question 6

(a) A man observes the angle of elevation of the top of a building to be 30°. He walks towards it in a horizontal line through its base. On covering 60m, the angle of elevation changes to 60°. Find the height of the building correct to the nearest metre. [3m]

(b) Find the equation of the right bisector of the line segment joining the points (1, 2) and (5, -6) [3m]

(c) In the given figure, DE is a chord parallel to the diameter AC of a circle with centre O. If $\angle CBD = 70°$, calculate $\angle CDE$.



[4m]

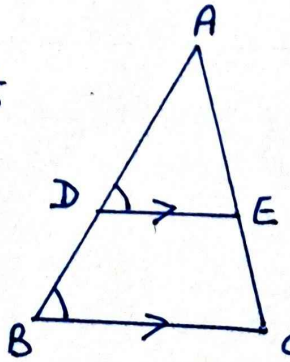
SECTION - B (40 Marks)

(Attempt any four questions from this section)

Question 7

(a) Prove that $\sqrt{\frac{1+\sin A}{1-\sin A}} = \frac{\cos A}{1-\sin A}$ [3m]

(b) In a ΔABC, D and E are points on AB and AC respectively such that $DE \parallel BC$. If AD = 8cm, BD = 7cm and BC = 12cm, find the length of DE.



[3m]

(c) Use the factor theorem to factorise completely

$x^3 + x^2 - 4x - 4$ [4m]

Class X Mathematics

Question 8

(a) Solve for x when $\dfrac{\sqrt{a+x}+\sqrt{a-x}}{\sqrt{a+x}-\sqrt{a-x}} = b$ [3m]

(b) Solve the following inequation and write the solution set. Also represent it on the number line.

$13x-5 < 15x+4 < 7x+12, x \in R$ [3m]

(c) A retailer buys a camera from a wholesaler for ₹ 30000. He marks the price of the camera 20% above his cost price and sells it to a consumer at 10% discount on the marked price. If the rate of GST is 18%, find

(i) the marked price of camera

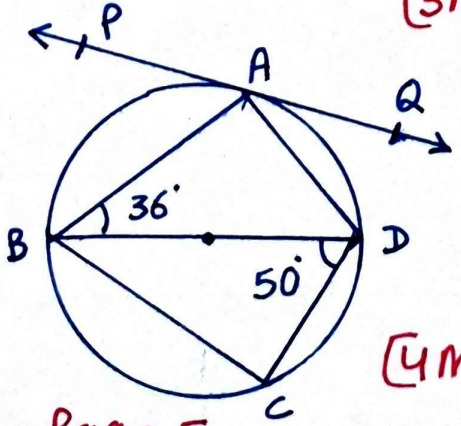
(ii) the amount which the consumer pays for the camera including GST. [4m]

Question 9

(a) If $P(9a-2, b)$ divides the line segment joining $A(3a+1, -3)$ and $B(8a, 5)$ in the ratio 3:1, find the values of 'a' and 'b'. [3m]

(b) If -4 is a root of the quadratic equation $x^2+px-4=0$ and the quadratic equation $x^2+px+k=0$ has equal roots, find the value of 'k' [3m]

(c) In the given figure, PQ is a tangent to the circle at A and BD is diameter. If $\angle ABD = 36°$ and $\angle BDC = 50°$, calculate (i) $\angle QAD$ (ii) $\angle PAB$ (iii) $\angle CBD$.



[4m]

Class 10, Mathematics

Question 10

(a) Find the marked price of a motorbike which is bought at ₹59,000 after paying GST at the rate of 18%. [3m]

(b) Sohan opened a recurring deposit account in a bank and deposited ₹800 per month for $1\frac{1}{2}$ years. If he received ₹15084 at the time of maturity, find the rate of interest per annum. [3m]

(c) Solve $\frac{1}{x+1} + \frac{2}{x+2} = \frac{4}{x+4}$

Give your answer correct to 2 places of decimal. [4m]

Question 11

(a) A plane left 30 minutes later than the scheduled time and in order to reach the destination 1500 km away, in time, it had to increase its speed by 250 km/hr from the usual speed. Find its usual speed. [3m]

(b) The equation of a line is $3x + 4y - 7 = 0$

Find (i) the slope of the given line

(ii) the equation of a line perpendicular to the given line and passing through the intersection of the line $x - y + 2 = 0$ and $3x + y - 10 = 0$ [3m]

(c) Show that the progression

$-4, -\frac{5}{2}, -1, \frac{1}{2}, 2, \ldots$ is an A.P.

Find its (i) first term (ii) common difference

(iii) 25th term. [4m]

Class X , Mathematics

Question - 12

(a) Use a graph paper to answer the following questions Take 1 cm = 1 unit on both the axes.

(i) Plot A(4, 4), B(4, -6) and C(8, 0), the vertices of a ΔABC

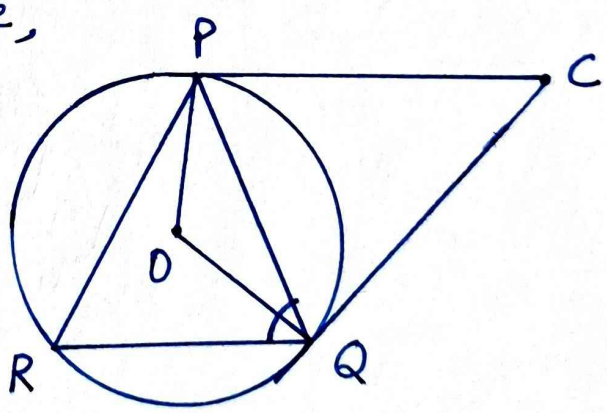
(ii) Reflect ABC on the y-axis and name it as $A'B'C'$

(iii) Write the co-ordinates of the images A', B' and C'

(iv) Give a geometrical name for the figure $AA'C'B'BC$.

(v) Find its Perimeter. [6 m]

(b) In the give figure, $PQ = QR$, $\angle RQP = 68°$, PC and CQ are tangents to the circle with centre O. Calculate the values of :-



(i) $\angle QOP$ (ii) $\angle QCP$ [4 m]