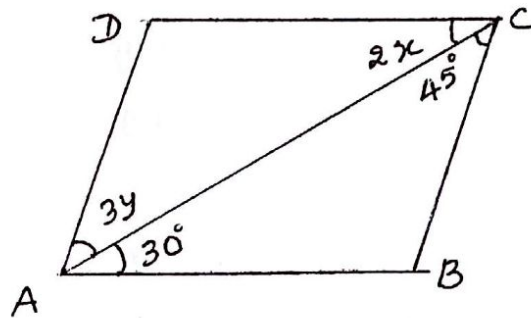


**Section A ( Answer all questions )****Question 1**

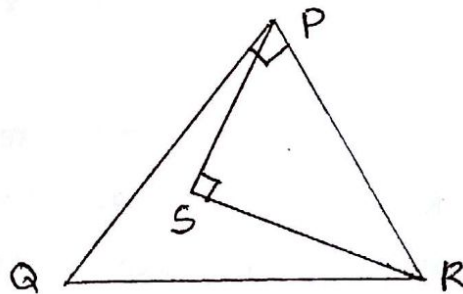
- (a) Calculate the rate of interest if ₹ 8000 amounts to ₹ 10648 in 3 years at compound interest [3]
- (b) Solve:  $7(y+3) - 2(x+2) = 14$ ,  $4(y-2) - 3(x-3) = 2$ , simultaneous equations. [4]
- (c) Evaluate  $\frac{\sin 77}{\cos 13} + \sin^2 42 - \cos^2 48 - 3 \tan^2 45$  [3]

**Question 2**

- (a) If  $(a + \frac{1}{a})^2 = 5$  then show that  $a^3 + \frac{1}{a^3} = 2\sqrt{5}$  [3]
- (b) A cuboid has its edges in the ratio 1 : 2 : 7. If the volume of the cuboid is  $378 \text{ cm}^3$ , find its total surface area. [4]
- (c) In the figure ABCD is a parallelogram. Find the values of x & y. [3]

**Question 3**

- (a) In  $\Delta PQR$ ,  $\angle QPR = 90^\circ$  and  $QR = 26 \text{ cm}$ . If  $PS \perp SR$ ,  $PS = 6 \text{ cm}$  and  $SR = 8 \text{ cm}$ . Find the area of  $\Delta PQR$



- (b) Factorise (i)  $x^2 - 30x + 216$  (ii)  $3x^4 - 243$  [4]
- (c) Evaluate  $\log \frac{81}{8} - 2 \log \frac{3}{2} + 3 \log \frac{2}{3} + \log \frac{3}{4}$  [3]

**Question 4**

- (a) Simplify  $\frac{2^{10+a} \times 4^{3a-5}}{2^{4a+1} \times 2^{3a-1}}$  [3]
- (b) A boy has pens and pencils which are together 40 in numbers. If he had 5 more pens and 5 less pencils, the number of pens become four times the number of pencils. Find the original number of each. [4]
- (c) If A is an acute angle and  $\operatorname{cosec} A = \sqrt{2}$ , find the value of  $\frac{3 \sin^2 A + 3 \cot^2 A}{\tan^2 A - \cos^2 A}$  [3]

**Section B (Answer any 4 questions only)**

**Question 5**

- (a) Solve for  $x$ ,  $\log(10x + 5) - \log(x - 4) = 2$
- (b) ABCD is a rectangle with  $AB = 48$  cm. M and N are the midpoints of its sides BC and CD respectively. If  $MN = 25$  cm, Calculate (i) the area of the rectangle ABCD  
(ii) The area of the  $\Delta MCN$ .
- (c) Rohit borrows Rs. 86000 from Arun for 2 years at 5% p.a simple interest. He immediately lends out this money to Akshay at 5% compound interest compounded annually for the same period. Calculate Rohit's gain in the transaction at the end of 2 years.

**Question 6**

- (a)  $\frac{16^{3/4}}{81} \times \left[ \frac{25}{9} \right]^{3/2} \div \left[ \frac{5}{2} \right]^3$
- (b) If A (p, q) is equidistant from P (-4, 3) and Q (3, -4) Show that  $p = q$
- (c) In a  $\Delta ABC$ ,  $2(\angle A - 20^\circ) = (\angle B + 10^\circ) = 2(\angle C - 10^\circ)$ . Find each angle of the triangle.

**Question 7**

- (a) Construct a parallelogram whose diagonals are 4 cm and 5.8 cm. The angle between the diagonals is  $60^\circ$ .
- (b) Factorise (i)  $a^3 + b^3 + a + b$  (ii)  $16x^2 - y^2 + 4yz - 4z^2$

**Question 8**

- (a) Solve  $5x - y = 5$  and  $3x - y = 3$  graphically. Determine the co-ordinate of the vertices of the triangle formed by these lines and the y-axis.
- (b) ABCD is a parallelogram of area  $900 \text{ cm}^2$ . AP is drawn perpendicular to BC and AQ is drawn perpendicular to DC. If  $AP = 24$  cm and  $AQ = 18.75$  cm, Calculate (i) AB (ii) BC and (iii) area of  $\Delta ABC$ .

**Question 9**

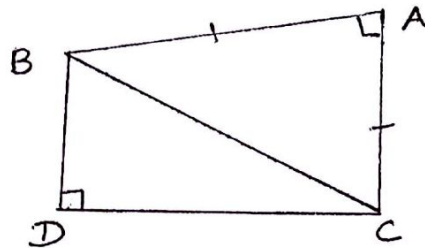
- (a) Simplify  $9^{3/2} - 3(5)^0 - \left(\frac{1}{81}\right)^{-1/2}$
- (b) If  $a + b - c = 4$  and  $a^2 + b^2 + c^2 = 38$ , Find  $ab - bc - ca$
- (c) Each of equal sides of an isosceles triangle is 4 cm greater than its height. If the base of the triangle is 24 cm; Calculate the perimeter and the area of the triangle

**Question 10**

(a) Show that the points A(1,1), B(4,1), C(4,4) and D (1,4) are the vertices of a square [3]

(b) If  $a + b = 9$  and  $ab = -2$ , Find: (i)  $a - b$  (ii)  $a^2 - b^2$  [3]

(c) In the given figure  $AB = AC$ ,  $\angle A = \angle D = 90^\circ$ ,  $BD = 18$  cm and  $DC = 24$  cm. Calculate the length of AB correct to two places of decimal. Also, find the perimeter of quadrilateral ABDC [4]



**Question 11**

(a) Calculate the compound interest accrued on ₹16,000 in 3 years, when the rates of interest for successive years are 10 %, 12 % and 15 % respectively [3]

(b) If  $\sin A = \frac{12}{13}$  Evaluate  $\frac{1}{\cos^2 A} - \tan^2 A$  [3]

(c) In the figure  $AB = BC$ , CE is parallel to BA,  $\angle ACD = 103^\circ$  and  $\angle AEC = 52^\circ$ . Prove that  $CE = ED$  [4]

