Chapter 6 Triangles

SECTION A 1 Mark each

Q1. In ΔABC, DE ∥ BC intersecting AB at D and AC at E, AD = 1cm, DB = 3cm, AE = 1.5cm, EC =?

Q2. In ΔABC, D is a point on AB and E is a point on AC, DE is joined. AD = 2, DB = 3, AE = 3 cm, EC = 4.5. Is DE ∥ BC?

Q3. State Pythagoras theorem

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SECTION B 2 Mark each

Q2. Prove that the sum of the squares of the sides of a rhombus is equal to the sum of the squares of its diagonals.

Q3. BL and CM are medians of a triangle ABC, right- angled at A. Prove that $4(BL^2 + CM^2) = 5BC^2$

Q4. Prove converse of mid-point theorem using basic proportionality theorem

Q5. D, E, F, are the mid-points of the sides AB, CA and BC respectively of a ΔABC. Using Area theorem of similar triangles, find the ratio of areas of triangles DEF and ABC.

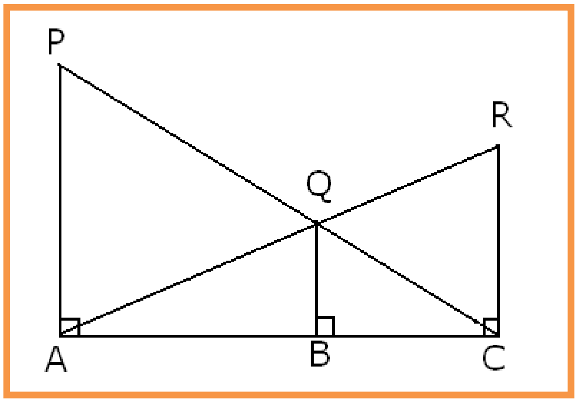
Q6. In the ΔABC, $\angle ACB = 90^\circ$ and CD ⊥ AB, D lies on AB. Prove that $CD^2 = BD \times AD$

Q7. Δ ABC and Δ DBC are on the same base BC and opposite side of it.

If AD and BC intersect at O, prove that $\frac{area(\Delta ABC)}{area(\Delta DBC)} = \frac{AO}{DO}$

SECTION C 3 Mark each

Q8. In the given figure, PA, QB and RC each is perpendicular to AC such that PA = x, RC= y, QB = z. Prove that $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$



Q9. ABCD is a square. F is the mid-point of AB. BE is the one-third of BC. If the area of the ΔBFE is $108 cm^2$, find the length of AC.

Q10. In an equilateral triangle ABC, D is a point on the side BC such that BD = $\frac{1}{3}$ Prove that $9AD^2 = 7AB^2$.

Q11. O is any point inside a rectangle ABCD. Prove that $OB^2 + OD^2 = OA^2 + OC^2$.

SECTION D 6 Mark each

Q12. Prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides. Apply the above theorem on the following: ABC is a triangle and PQ is a straight line meeting AB in P and AC in Q. If AP = 1 cm, PB = 3cm, AQ = 1.5 cm, QC = 4.5 cm, Prove that the area of Δ APQ is one-sixteenth of the area of ΔABC.

Q13. Prove that in a triangle, a line drawn parallel to one side to intersect the other two sides in distinct point, divides the two sides in the same ratio. Using above, prove that the Quadrilateral ABCD is a trapezium if the diagonals AC and BD of the quadrilateral ABCD intersect each other at O such that $\frac{AO}{OC} = \frac{BO}{OD}$