

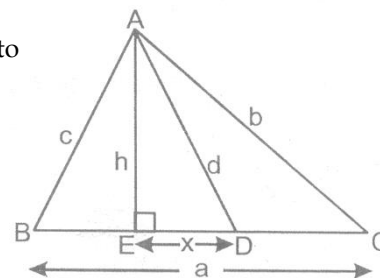
CLASS X- MATHEMATICS
TRIANGLES
ASSIGNMENT-1

MULTIPLE CHOICE QUESTION - 1.1

1. The perimeters of two similar triangles are 25 cm and 15 cm respectively. If one side of first triangle is 9 cm, then the corresponding side of the other triangle is
 (A) 6.2 cm (B) 3.4 cm (C) 5.4 cm (D) 8.4 cm

2. In the following figure, $AE \perp BC$, D is the mid point of BC, hen x is equal to

- (A) $\frac{1}{a} \left[b^2 - d^2 - \frac{a^2}{4} \right]$ (B) $\frac{h+d}{3}$
 (C) $\frac{c+d-h}{2}$ (D) $\frac{a^2 + b^2 + d^2 - c^2}{4}$



3. Two triangles ABC and PQR are similar, if $BC : CA : AB = 1 : 2 : 3$, then $\frac{QR}{PR}$ is

- (A) $\frac{2}{3}$ (B) $\frac{1}{2}$ (C) $\frac{1}{\sqrt{2}}$ (D) $\frac{2}{3}$

4. In a triangle ABC, if angle B = 90° and D is the point in BC such that $BD = 2 DC$, then

- (A) $AC^2 = AD^2 + 3 CD^2$ (B) $AC^2 = AD^2 + 5 CD^2$ (C) $AC^2 = AD^2 + 7 CD^2$ (D) $AC^2 = AB^2 + 5 BD^2$

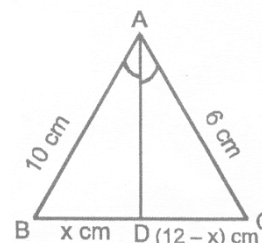
5. P and Q are the mid points of the sides AB and BC respectively of the triangle ABC, right-angled at B, then

- (A) $AQ^2 + CP^2 = AC^2$ (B) $AQ^2 + CP^2 = \frac{4}{5} AC^2$
 (C) $AQ^2 + CP^2 = \frac{5}{4} AC^2$ (D) $AQ^2 + CP^2 = \frac{3}{5} AC^3$

6. In a $\triangle ABC$, AD is the bisector of $\angle A$, meeting side BC at D.

If $AB = 10$ cm, $AC = 6$ cm, $BC = 12$ cm, find BD.

- (A) 3.3 (B) 18
 (C) 7.5 (D) 1.33



7. In a triangle ABC, a straight line parallel to BC intersects AB and AC at point D and E respectively. If the area of ADE is one-fifth of the area of ABC and $BC = 10$ cm, then DE equals

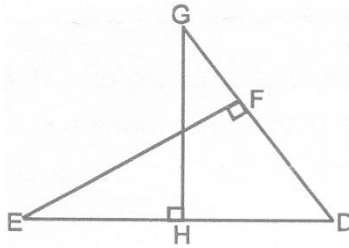
- (A) 2 cm (B) $2\sqrt{5}$ cm (C) 4 cm (D) $4\sqrt{5}$ cm

8. ABC is a right-angle triangle, right angled at A. A circle is inscribed in it. The lengths of the two sides containing the right angle are 6 cm and 8 cm, then radius of the circle is

- (A) 3 cm (B) 2 cm (C) 4 cm (D) 8 cm

SUBJECTIVE QUESTION - 1.2

1. Given $\angle GHE = \angle DFE = 90^\circ$, $DH = 8$, $DF = 12$, $DG = 3x - 1$ and $DE = 4x + 2$.



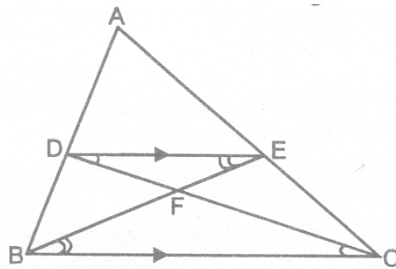
Find the lengths of segments DG and DE.

2. In the given figure, DE is parallel to the base BC of triangle ABC and $AD : DB = 5 : 3$. Find the ratio :-

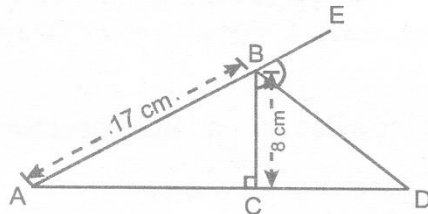
(i) $\frac{AD}{AB}$

[CBSE - 2018]

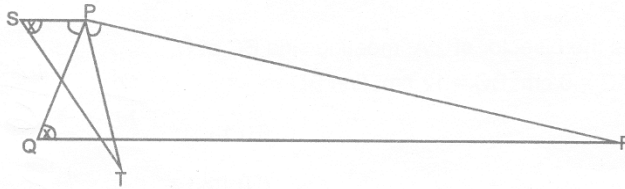
(ii) $\frac{\text{Area of } \triangle DEF}{\text{Area of } \triangle CFB}$



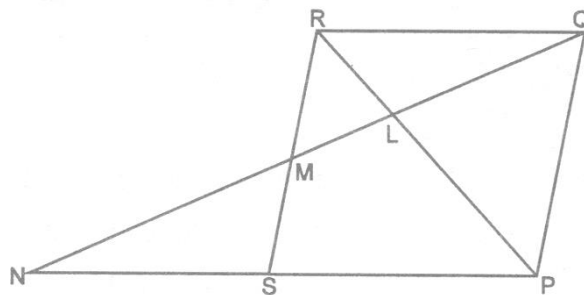
3. In Figure, $\triangle ABC$ is a right-angled triangle, where $\angle ACB = 90^\circ$. The external bisector BD of $\angle ABC$ meets AC produced at D. If $AB = 17$ cm and $BC = 8$ cm, find the AC and BD.



4. In figure, $\angle QPS = \angle RPT$ and $\angle PST = \angle PQR$. Prove that $\triangle PST \sim \triangle PQR$ and hence find the ratio $ST : PT$, if $PR : R = 4 : 5$.



5. In the figure, PQRS is a parallelogram with $PQ = 16$ cm and $QR = 10$ cm. L is a point on PR such that $RL : LP = 2 : 3$. QL produced meets RS at M and PS produced at N.

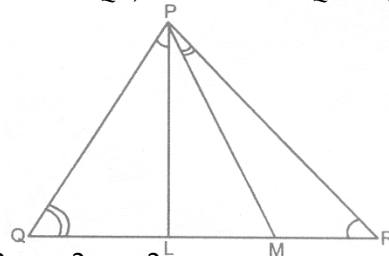


Find the lengths of PN and RM.

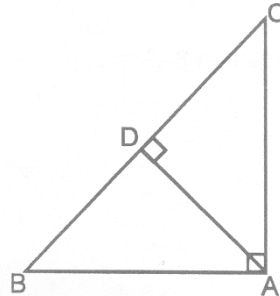
6. In ΔABC , D and E are points on AB and AC respectively such that $DE \parallel BC$. If $AD = 2.4$ cm, $AE = 3.2$ cm, $DE = 2$ cm and $BC = 5$ cm, find BD and CE.

7. In a triangle PQR, L and M are two points on the base QR, such that $\angle PQL = \angle QRP$ and $\angle RPM = \angle RQP$. Prove that :

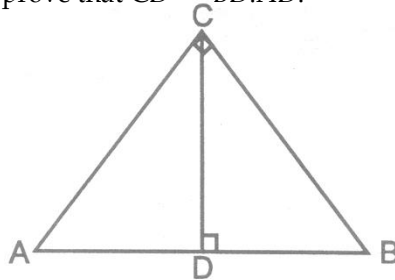
- (i) $\Delta PQL \sim \Delta RPM$
- (ii) $QL \times RM = PL \times PM$
- (iii) $PQ^2 = QR \times QL$



8. In figure, $\angle BAC = 90^\circ$, $AD \perp BC$. prove that $AB^2 = BD^2 - CD^2$.



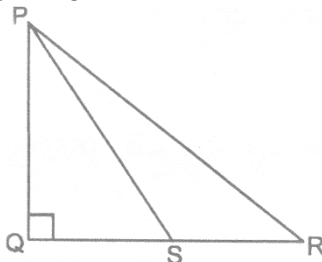
9. In figure, $\angle ACB = 90^\circ$, $CD \perp AB$ prove that $CD^2 = BD \cdot AD$.



10. In a right triangle, prove that the square on the hypotenuse is equal to sum of the squares on the other two sides.

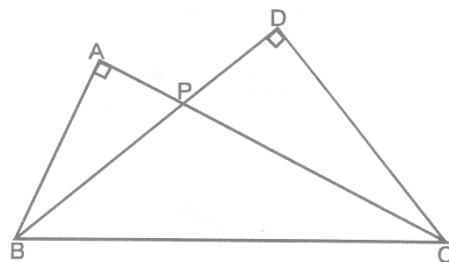
Using the above result, prove the following:

In figure PQR is a right triangle, right angled at Q. If $QS = SR$, show that $PR^2 = 4PS^2 - 3PQ^2$.

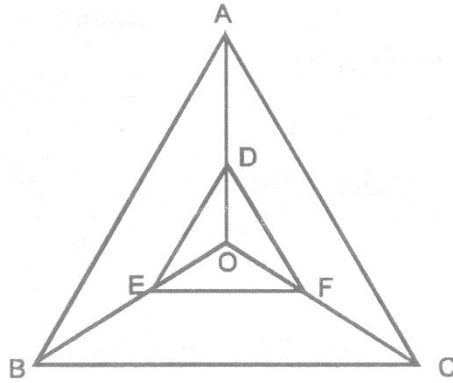


11. In ΔABC , $\angle ABC = 135^\circ$. Prove that $AC^2 = AB^2 + BC^2 + 4ar(\Delta ABC)$.

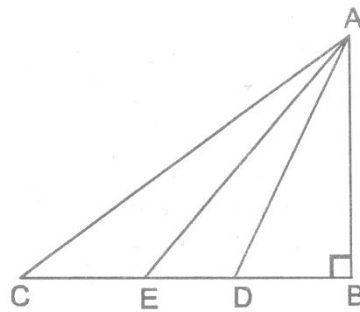
12. In figure, ABC and DBC are two right triangles with the common hypotenuse BC and with their sides AC and DB intersecting at P. Prove that $AP \times PC = DP \times PB$. [CBSE - 2019]



13. Any point O, inside $\triangle ABC$, is joined to its vertices. From a point D on AO, DE is drawn so that $DE \parallel AB$ and $EF \parallel BC$ as shown in figure. Prove that $DF \parallel AC$. [CBSE-2019]



14. In figure, D and E trisect BC. Prove that $8AE^2 = 3AC^2 + 5AD^2$ [CBSE - 2016]



15. The perpendicular AD on the base BC of a $\triangle ABC$ meets BC at D so that $2DB = 3CD$. Prove that $5AB^2 = 5AC^2 + BC^2$. [CBSE - 2019]

16. Prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares on their corresponding sides.

Using the above, do the following :

The diagonals of a trapezium ABCD, with $AB \parallel DC$, intersect each other at point O. If $AB = 2CD$, find the ratio of the area of $\triangle AOB$ to the area of $\triangle COD$ [CBSE - 2018]

17. D, E and F are the mid-points of the sides AB, BC and CA respectively of $\triangle ABC$. Find $\frac{\text{ar}(\triangle DEF)}{\text{ar}(\triangle ABC)}$.

[CBSE - 2018]

18. D and E are points on the sides CA and CB respectively of $\triangle ABC$ right-angled at C. Prove that $AE^2 + BD^2 = AB^2 + DE^2$.

19. In figure, $DB \perp BC$, $DE \perp AB$ and $AC \perp BC$. Prove that $\frac{BE}{DE} = \frac{AC}{BC}$ [CBSE - 2018]

