1. What value of $x$ will make $DE \parallel AB$ in the given figure?

![Triangle Diagram]

2. In figure, $DE$ is parallel to base $BC$. If $AD = 2.5 \text{ cm}$, $BD = 3.0 \text{ cm}$ and $AE = 3.75 \text{ cm}$, find the length of $AC$.

![Triangle Diagram]

3. In the figure, $XY \parallel BC$. Find the length of $XY$.

![Triangle Diagram]

4. In figure, considering triangles $BEP$ and $CPD$, prove that:
   \[ BP \times PD = EP \times PC \]

![Triangle Diagram]

5. If $\triangle ABC \sim \triangle PQR$. Also $\text{ar}(\triangle ABC) = 4 \times \text{ar}(\triangle PQR)$. If $BC = 12 \text{ cm}$, find $QR$.

6. The areas two similar triangles $ABC$ and $DEF$ are $36 \text{ cm}^2$ and $81 \text{ cm}^2$ respectively. If $EF = 6.9 \text{ cm}$, determine $BC$.

$\text{Area}(\triangle ABC) = 36 \text{ cm}^2, \text{Area}(\triangle DEF) = 81 \text{ cm}^2, EF = 6.9 \text{ cm}$

7. Two isosceles triangles have equal angles and their areas are in the ratio $81:25$. Find the ratio of their corresponding heights.

8. D, E and F are respectively the mid points of the sides BC, CA and AB of $\triangle ABC$. Find the ratio of the areas of $\triangle DEF$ and $\triangle ABC$.

9. The perimeters of two similar triangles are $36\text{ cm}$ and $48\text{ cm}$ respectively. If one side of the first triangle is $9\text{ cm}$, what is the corresponding side of the other triangle?

10. In triangle $ABC$, $AB = \sqrt{3}a$ and $BC = 2a$. Prove that

    ![Triangle Diagram]

11. In triangle $ABC$, $\angle BAC = 90^\circ$ and $AD \perp BC$. If $BD = 8 \text{ cm}$, $DC = 18 \text{ cm}$, find $AD$.

12. Two poles of height $8 \text{ m}$ and $13 \text{ m}$ stand on a plane ground. If the distance between their tips is $13 \text{ m}$, find the distance between their feet.

13. The perpendicular from $A$ on side $BC$ of a triangle $ABC$ intersects $BC$ at $D$ such that $BD = 3CD$. Prove that $2AB^2 - 2AC^2 = BC^2$.

14. In an isosceles triangle $ABC$ with $AB = AC$, $BD$ is a perpendicular from $B$ to the side $AC$. Prove that $BD^2 = CD^2 = 2CD \cdot AD$.

15. $P$ and $Q$ are points on the sides $CA$ and $CB$ respectively of a $\triangle ABC$ right angled at $C$. Prove that $AQ^2 + BP^2 = AB^2 + PQ^2$.

16. In figure, $T$ trisects the side $QR$ of right triangle $PQR$.

    Prove that $8PT^2 = 3PR^2 + 5PS^2$.

17. If $BL$ and $CM$ are medians of a triangle $ABC$ right angled at $A$, then prove that $4(\text{BL}^2 + \text{CM}^2) = 5 \text{BC}^2$.