

7. Triangles 2020

1. If two triangles ABC and DEF are similar and $\angle A = 67^\circ$, $\angle E = 63^\circ$, then the measure of $\angle C$ is _____.
2. ABCD is a trapezium in which $AB \parallel DC$ and its diagonals intersect each other at O. If $AB = 3 CD$, find the ratio of the areas of triangles AOB and COD.
3. If the areas of two similar triangles are equal, then prove that the triangles are congruent.
4. Prove that the sum of the squares of the sides of a rhombus is equal to the sum of the squares of its diagonals.
5. Prove that in a right triangle, the square of the hypotenuse is equal to sum of the squares of the remaining two sides.
6. Given $\Delta ABC \sim \Delta PQR$, if $\frac{AB}{PQ} = \frac{1}{3}$, then $\frac{ar(\Delta ABC)}{ar(\Delta PQR)} = \underline{\hspace{2cm}}$.
7. ABC is an equilateral triangle of side $2a$, then length of one of its altitude is _____.
8. In Fig. 2 $DE \parallel AC$ and $DC \parallel AP$. Prove that $\frac{BE}{EC} = \frac{BC}{CP}$.

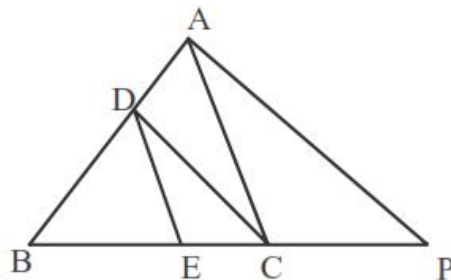


Fig 2

9. In Fig.5, $\angle D = \angle E$ and $\frac{AD}{DB} = \frac{AE}{EC}$,
prove that BAC is an isosceles triangle.

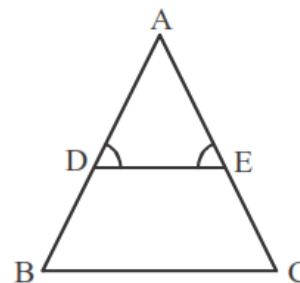


Fig 5

10. In a triangle, if square of one side is equal to the sum of the squares of the other two sides, then prove that the angle opposite to the first side is a right angle.
11. ABC is an equilateral triangle of side $2a$, then length of one of its altitude is _____.
12. ABC and BDE are two equilateral triangles such that D is the mid-point of BC. Ratio of the areas of triangles ABC and BDE is _____.
13. Given $\Delta ABC \sim \Delta PQR$, if $\frac{AB}{PQ} = \frac{1}{3}$, then $\frac{ar(\Delta ABC)}{ar(\Delta PQR)} =$ _____.
14. A ladder 10 m long reaches a window 8 m above the ground. The distance of the foot of the ladder from the base of the wall is _____ m.
15. In fig. 1, $MN \parallel BC$ and $AM : MB = 1 : 2$, then $\frac{ar(\Delta AMN)}{ar(\Delta ABC)} =$ _____.

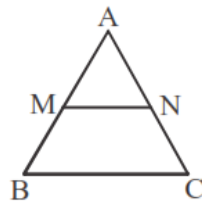
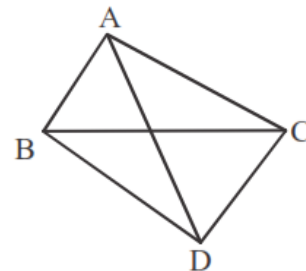


Fig. 1

16. In Fig. 5, ABC and DBC are two triangles on the same base BC. If AD intersects BC at O, show that

$$\frac{ar(\Delta ABC)}{ar(\Delta DBC)} = \frac{AO}{DO}$$



17. In $\triangle ABC$, $AB = 6\sqrt{3}$ cm, $AC = 12$ cm and $BC = 6$ cm, then $\angle B =$ _____.

18. Two triangles are similar if their corresponding sides are _____.

19. In Fig. 6, if $AD \perp BC$, then prove that $AB^2 + CD^2 = BD^2 + AC^2$.

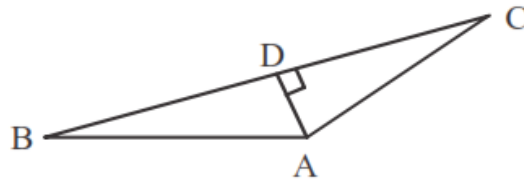


Fig. 6

20. In Fig. 7, if $\triangle ABC \sim \triangle DEF$ and their sides of lengths (in cm) are marked along them, then find the lengths of sides of each triangle.

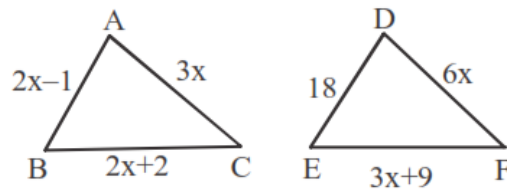


Fig. 7

21. If $\triangle ABC \sim \triangle DEF$ such that $AB = 1.2$ cm and $DE = 1.4$ cm, the ratio of the areas of $\triangle ABC$ and $\triangle DEF$ is

(a) 49 : 36

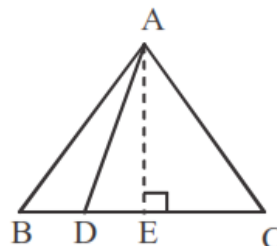
(b) 6 : 7

(c) 7 : 6

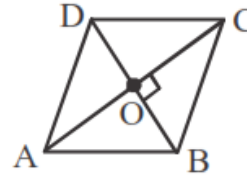
(d) 36 : 49

22. In an equilateral triangle ABC , D is a point on the side BC such that

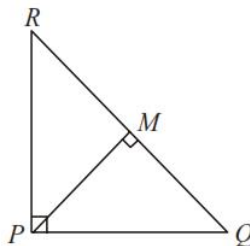
$BD = \frac{1}{3} BC$. Prove that $9 AD^2 = 7 AB^2$.



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



24. If the areas of two similar triangles are equal, then prove that the triangles are congruent.
25. Prove that the ratio of the areas of two similar triangles is equal to the ratio of squares of their corresponding medians.
26. Let $\triangle ABC \sim \triangle DEF$ and their areas be respectively 81 cm^2 and 144 cm^2 . If $EF = 24 \text{ cm}$, then length of side BC is _____ cm.
27. The perimeters of two similar triangles are 30 cm and 20 cm respectively. If one side of the first triangle is 9 cm long, find the length of the corresponding side of the second triangle.
28. In Figure-5, $\triangle PQR$ is right-angled at P . M is a point on QR such that PM is perpendicular to QR . Show that $PQ^2 = QM \times QR$.



29. If a line is drawn parallel to one side of a triangle to intersect the other two sides at distinct points, prove that the other two sides are divided in the same ratio.

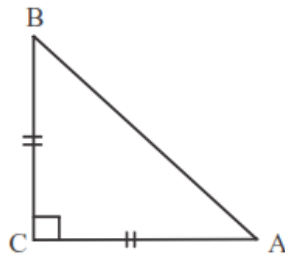
30. In Figure 1, ABC is an isosceles triangle, right-angled at C. Therefore

(a) $AB^2 = 2AC^2$

(b) $BC^2 = 2AB^2$

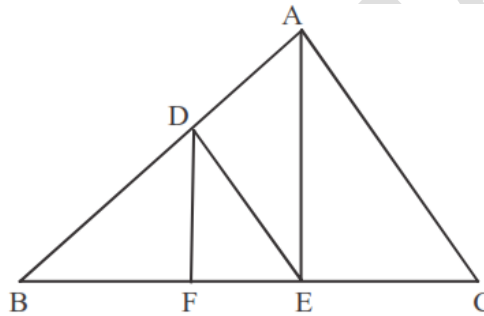
(c) $AC^2 = 2AB^2$

(d) $AB^2 = 4AC^2$



31. In the given Figure 5, $DE \parallel AC$ and $DF \parallel AE$.

Prove that $\frac{BF}{EF} = \frac{BE}{EC}$.



32. The perimeters of two similar triangles $\triangle ABC$ and $\triangle PQR$ are 35cm and 45cm respectively, then the ratio of the areas of the two triangles is _____

33. In the figure, if $\angle ACB = \angle CDA$, $AC = 6$ cm and $AD = 3$ cm, then find the length of AB

