

CLASS X SAMPLE PAPER MATHS

Very Important Questions based on Similar Triangles for Exam

1. Prove that the line drawn through the mid point of one side of a triangle parallel to another side bisects the third side.
2. If ABC is an equilateral triangle of side 2a. Prove that altitude AD is $a\sqrt{3}$.
3. In given figure – 1., ABC and DBC are two triangles on the same base BC. If AD bisects BC at O, Show that $\frac{ar(\Delta ABC)}{ar(DBC)} = \frac{AO}{DO}$

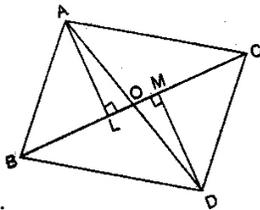


Fig – 1.

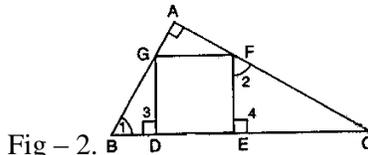


Fig – 2.

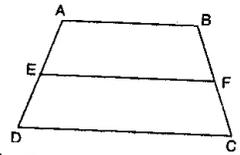


Fig – 3.

4. In given figure- 2, DEFG is a square and $\angle BAC$ is a right angle. Show that $DE^2 = BD \times EC$
5. If the triangle ABC. $DE \parallel BC$ and $DE : BC = 4 : 5$ find the ratio of area of triangle ADE to area of trapezium BCED.
6. In fig – 3., ABCD is a trapezium in which $AB \parallel EF \parallel DC$ Prove that $AE : ED = BF : FC$
7. prove that the area of the equilateral triangle described on the side of a square is half the area of the equilateral triangle described on its diagonal.
8. In given figure-5, AD is a median of ΔABC and $AE \perp BC$. Prove that
 - i) $AC^2 = AD^2 + BC \cdot DE + \left(\frac{BC}{2}\right)^2$
 - ii) $AB^2 = AD^2 - BC \cdot DE + \left(\frac{BC}{2}\right)^2$
 - iii)

$$AC^2 + AB^2 = 2AD^2 + \frac{1}{2}BC^2$$

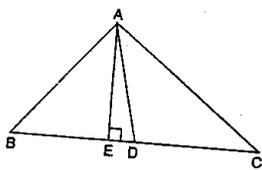


Fig -5,

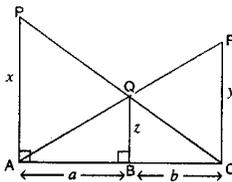


Fig - 6

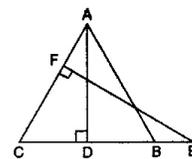


fig-7

9. The perpendicular AD on the base BC of a triangle ABC interests BC internally at D such that $BD = 3CD$. Prove that $2AB^2 = 2AC^2 + BC^2$.
10. Prove that if the areas of two similar triangles are equal, then the triangles are congruent.
11. Two triangles ABC and PQR are similar. If $\text{area}(\triangle ABC) = 4 \text{ area}(\triangle PQR)$ and $BC = 12$ cm. Find QR
12. In $\triangle ABC$, $AD \perp BC$ and $BD = 3CD$. Prove that $2AB^2 = 2AC^2 + BC^2$
13. In $\triangle ABC$, $\angle A = 90^\circ$, $AD \perp BC$. Prove that $AB^2 + CD^2 = BD^2 + AC^2$
14. In given figure-6, PA, QB and RC are each perpendicular to AC and $AP = x$, $QB = z$, $RC = y$, $AB = a$, and $BC = b$. Prove that $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$
15. ABC is a right angle triangle at C, If p be the length of the perpendicular from C to AB and $AB = c$, $BC = a$, $CA = b$, then prove that (a) $pc = ab$ (b) $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$
16. In given figure-7, E is the point on side CB produced of an isosceles $\triangle ABC$ with $AB = AC$. If $AD \perp BC$ and $EF \perp AC$, prove that $\triangle ABD \approx \triangle ECF$
17. In given figure-8, the line segment DE is parallel to side BC of triangle ABC and it divides the triangle into two parts of equal areas. Find the ratio of $\frac{BD}{AB}$

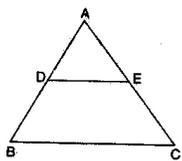


Fig -8.

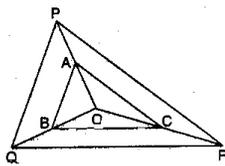


fig - 9.

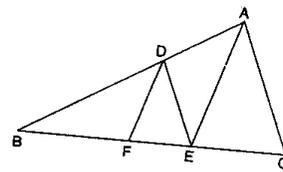


fig 10.

18. In given figure -9, A, B and C are points on OP, OQ and OR respectively such that $AB \parallel PQ$ and $AC \parallel PR$. Show that $BC \parallel QR$.
19. The areas of two similar triangles are 121 cm^2 and 64 cm^2 respectively. If the median of the first triangle is 12.1 cm. Find the corresponding median of the other.

20. In given figure-10, $DE \parallel AC$ and $DF \parallel AE$. Prove that $\frac{BF}{FE} = \frac{BE}{EC}$
21. ABC is a right angled at A, $AD \perp BC$. If $BC = 13\text{cm}$, $AC = 5\text{cm}$. Find the ratio of the areas of $\triangle ABC$ and $\triangle DAC$.
22. In given figure-11. $\triangle ABC$ and $\triangle DBC$ are on the same base BC. Prove that $\frac{\text{ar}(\triangle ABC)}{\text{ar}(\triangle DBC)} = \frac{AX}{DX}$

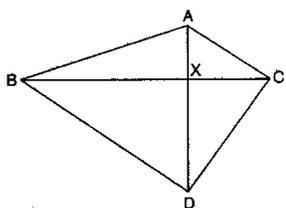


Fig -11.

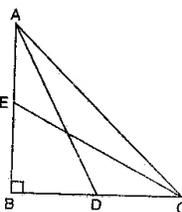


Fig -12.

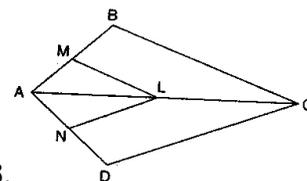


Fig 13.

23. Prove that three times the square of any side of an equilateral triangle is equal to four times the square on the altitude.
24. In given figure -12, AD and CE are medians of a triangle ABC right angled at A. Prove that $4(AD^2 + CE^2) = 5AC^2$
25. In a rhombus ABCD, prove that $AB^2 + BC^2 + CD^2 + DA^2 = BD^2 + AC^2$
26. In a isosceles $\triangle ABC$, $AC = BC$ and $AB^2 = 2AC^2$, Prove that C is a right angle.
27. In given figure-13, $LM \parallel CB$ and $LN \parallel CD$. Prove that $\frac{AM}{AB} = \frac{AN}{AD}$
28. Find the length of the diagonal of a square whose side measures 50 cm.
29. The perimeters of two similar triangles are 24cm and 18cm. If one side of the first triangle is 8 cm, what is the corresponding side of the other triangle?

**MATHS CONCEPTS, AIDC, ZOO-ROAD
GUWAHATI, Ph.No. 98640-91419**

Dr. M.K. Mazumdar, M.Sc., Ph.D.
PGT, Maria's Public School
Guwahati. Ph.No. 98640-91419