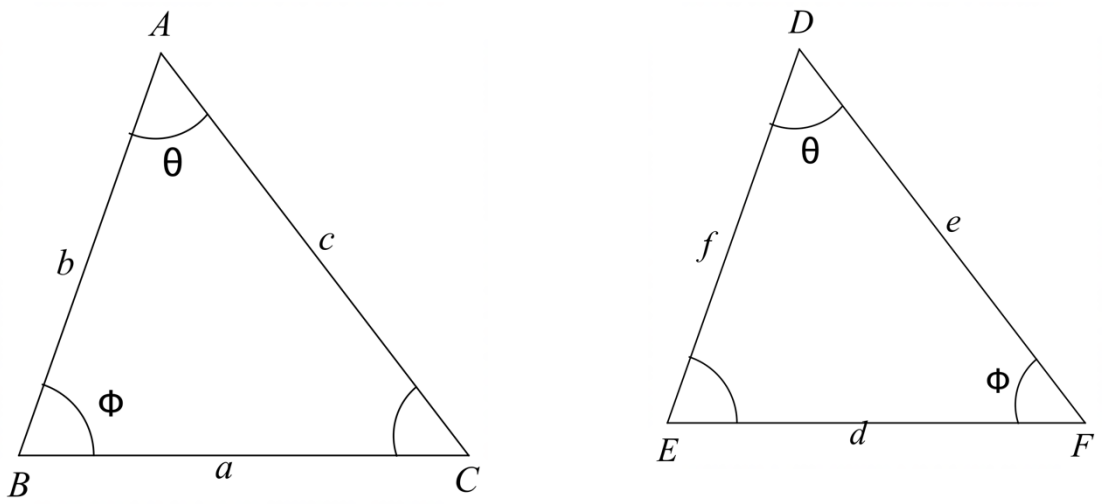
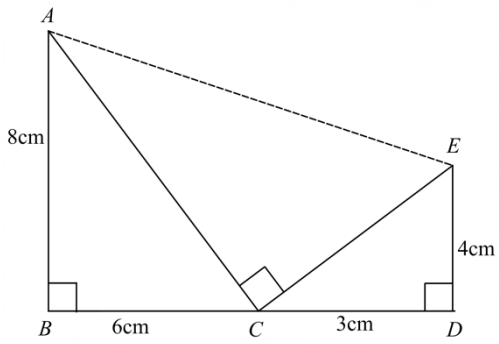
Triangles

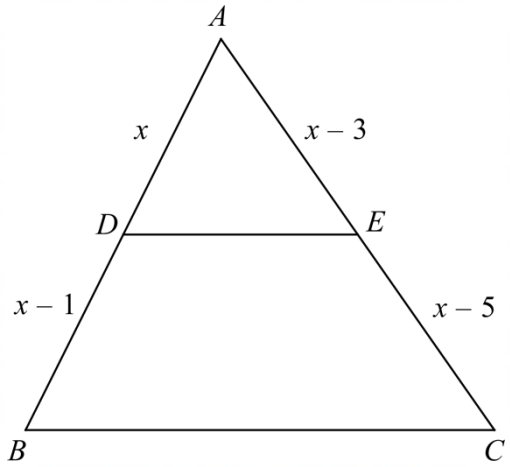
1 Mark

1. $\Delta ABC \sim \Delta DEF$. If $DE = 2AB$ and $BC = 3cm$ then EF is equal to_____
2. In ΔDEW, $AB // EW$ if $AD = 4cm$, $DE = 12cm$ and $DW = 24cm$ then the value of DB=_____
3. 

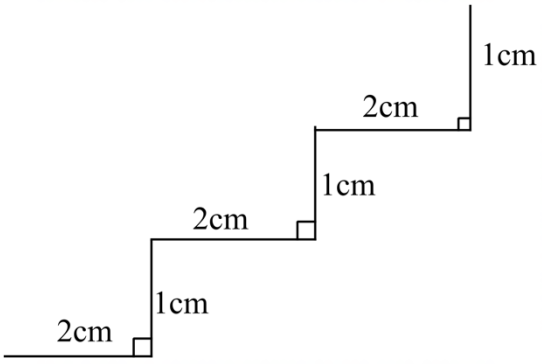
In the figure the value of cd = _____
4. In ΔABC, $AB = 6cm$, $BC = 12cm$ and $CA = 6\sqrt{3}cm$ then measure of $\angle A$
5. The area of two isosceles triangles are in the ratio 16:25. The ratio of their corresponding heights is_____
6. $\Delta AMB \sim \Delta CMD$. Also $2ar(\Delta AMB) = ar(\Delta CMD)$ the length of MD
7. Find AE



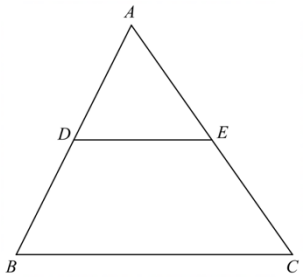
8. In ΔABC, D and E are the points on side AB and AC respectively such that $DE // BC$ and AD:BD = 3:1. If EA = 3.3 cm then AC =_____
9. ABC and BDE are two equilateral triangles such that D is the midpoint of BC. Ratio of the areas of triangles ABC and BDE is_____
10. In ΔABC, $DE \parallel BC$, In the figure the value of x is _____



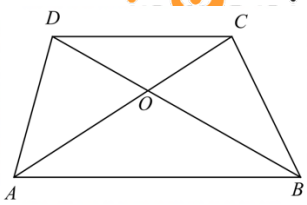
11. In ΔABC, $\angle B = 90°$, BE is perpendicular bisector of AC then $\frac{ar(\Delta BEC)}{ar(\Delta ABC)} =$ ____
12. The altitude of an equilateral triangle, having the length of its side 12cm is
13. The straight line distance between A and B is



14. If in an isosceles right-angled triangle the length of the hypotenuse is 10 cm then the perimeter of the triangle is
15. In the given figure, ΔABC, $DE \parallel BC$ and $\frac{AD}{DB} = \frac{3}{5}$ If $AC = 5.6cm$, then $AE = ?$



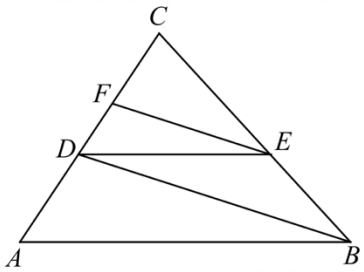
16. In the given figure, $AB//DC$ and the diagonals AC and BD intersect at O. If $AO=(3x-1)cm$, and $BO=(2x+1)cm$, $OC=(5x-3)cm$ and $OD=(6x-5)cm$, then x = ?



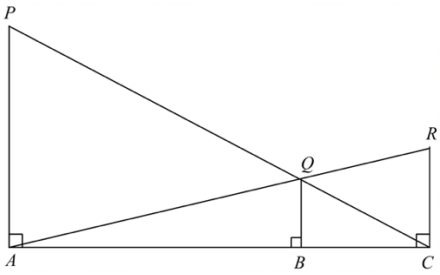
17. $\Delta ABC \sim \Delta DEF$ and the perimeters of ΔABC and ΔDEF are 30cm and 18cm respectively. If BC = 9cm, then EF = ?

2/3/4 Marks

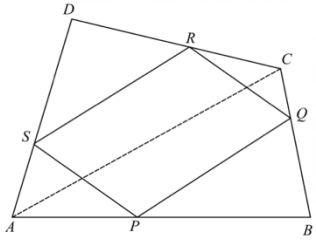
1. In the given figure, $AB//DE$ and $BD//EF$, prove that $DC^2 = CF \times AC$



2. In the given figure PA, QB and RC each is perpendicular to AC Such that PA = x, RC = y, QB = z, AB =a and BC= b.
Prove that $\frac{1}{x}+\frac{1}{y}=\frac{1}{z}$

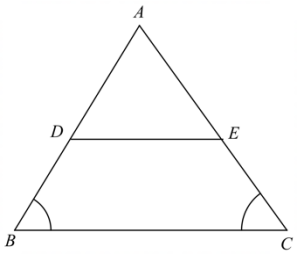


3. If three or more parallel lines are intersected by two transversals, prove that the intercepts made by them on the transversals are proportional.
4. In ΔABC, D and E are two points on AB such that AD = BE. If $DP//BC$ and $EQ//AC$, prove that $PQ//AB$.
5. In the adjoining figure, ABCD is a quadrilateral and P, Q, R, S are the points of trisection of the sides AB, BC, CD and DA respectively.
Prove that PQRS is a parallelogram.

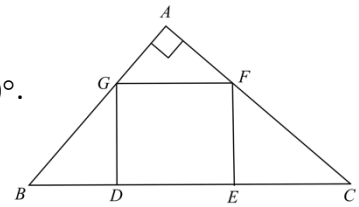


6. Prove that the ratio of the perimeters of two similar triangles is the same as the ratio of their corresponding sides.
7. The perimeters of two similar triangles are 25cm and 15cm respectively. If one side of the first triangle is 9cm, find the corresponding side of second triangle.
8. In ΔABC, $AD \perp BC$ and $AD^2 = BD.CD$. Prove that $\angle BAC = 90°$.
9. In a ΔABC, $AB = AC$ and D is a point on AC such that $BC^2 = AC \times DC$. Prove that $BD = BC$.

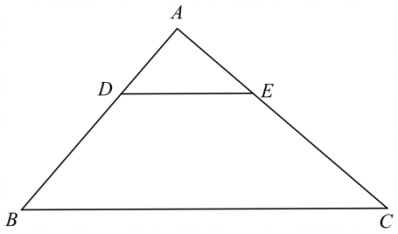
10. In the given figure, in ΔABC, $\angle B = \angle C$ and $BD = CE$
Prove that $DE \,//\, BC$.



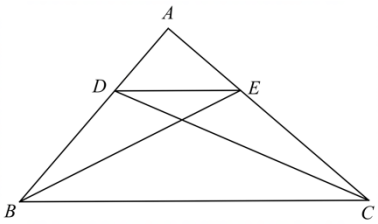
11. In the given figure, DEFG is a square and $\angle BAC = 90°$.
Prove that :(i) $\Delta AGF \sim \Delta DBG$ (ii) $\Delta AGF \sim \Delta EFC$
(iii) $\Delta DBG \sim \Delta EFC$ (iv) $DE^2 = BD \times EC$



12. Two right triangles ABC and DBC are drawn on the same hypotenuse BC and on the same side of BC. Also AC and BD intersect at P. Prove that $AP \times PC = BP \times PD$.
13. If the diagonal BD of a quadrilateral ABCD bisects both $\angle B$ and $\angle D$. Prove that
$$\frac{AB}{BC} = \frac{AD}{CD}$$
14. Prove that the ratios of area of two similar triangles is equal to the ratio of the squares of their corresponding altitudes.
15. Prove that the ratios of area of two similar triangles is equal to the ratio of the squares of their corresponding medians.
16. Prove that the ratios of area of two similar triangles is equal to the ratio of the squares of their corresponding angle bisector segments.
17. Prove that the area of an equilateral triangle described on a side of a right-angled isosceles is half the area of the equilateral triangle described on its hypotenuse.
18. In the given figure, $DE \,//\, BC$ and $AD : BD = 2 : 3$.
Show that $ar(\Delta ADE) : ar(\Delta ABC) = 4 : 25$

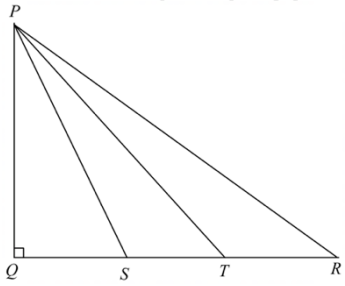


19. In the given figure, $DE \,||\, BC$ and $AD : DB = 5 : 4$.
Find the ratio of $ar(\Delta DFE) : ar(\Delta CFB)$.



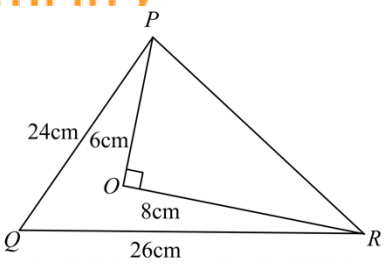
20. In a rhombus of side 10cm, one of the diagonal is 12cm long. Find the length of the second diagonal.
21. In ΔABC, $AD \perp BC$ such that $AD^2 = BD.CD$. Prove that ΔABC is right angled at A.

22. In the figure given below, ΔPQR is right angled at Q and the points S and T trisect the side QR.
Prove that: $8PT^2 = 3PR^2 + 5PS^2$

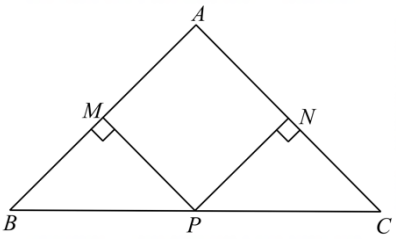


23. In ΔABC, $\angle B = 90°$ and D is mid- point of BC. Prove that $AC^2 = AD^2 + 3CD^2$.
24. In ΔABC, $\angle C = 90°$ and D is mid -point of BC. Prove that $AB^2 = \left(4AD^2 - 3AC^2\right)$.
25. In an isosceles ΔABC, AB=AC and $BD \perp AC$. Prove that $\left(BD^2 - CD^2\right) = 2CD.AD$.
26. In an isosceles ΔABC, AB =AC and D is a point on BC. Prove that $\left(AB^2 - AD^2\right) = BD.CD$
27. ΔABC is a right triangle in which $\angle C = 90°$ and $CD \perp AB$. If BC = a, CA = b, AB = c and CD = p then prove that (i) $cp = ab$ (ii) $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$.
28. In ΔABC, $\angle ABC > 90°$ and $AD \perp \left(CB\ produced\right)$. Prove that $AC^2 = AB^2 + BC^2 + 2BC.BD$
29. In ΔABC, if AD is median, then prove that $\left(AB^2 + AC^2\right) = 2\left(AD^2 + BD^2\right)$
30. In ΔABC, D is midpoint of BC and $AE \perp BC$. If $AC > AB$, show that $AB^2 = AD^2 - BC.DE + \frac{1}{4}BC^2$.

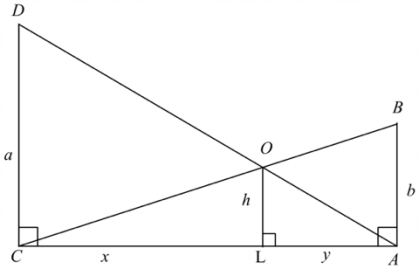
31. In given figure, O is the point inside a ΔPQR such that $\angle POR = 90°$, $OP = 6$cm and $OR = 8$cm. If $PQ = 24$cm and $QR = 26$cm, prove that ΔPQR is right angled.



32. In the figure ΔABC is isosceles with AB = AC, P is mid point of BC. If $PM \perp AB$ and $PN \perp AC$. Prove that MP = NP.

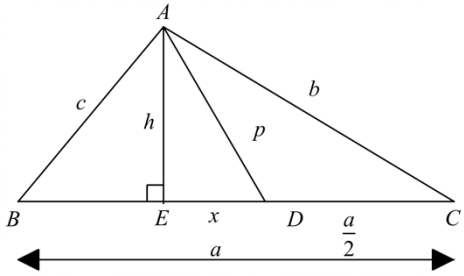


33. Two poles of height a meters and b meters are apart. Prove that the height of the point of intersection of the lines joining the top of each pole to the foot of the opposite pole is given by $\frac{ab}{a+b}meters$.



34. In a quadrilateral ABCD, $\angle B = 90°$. If $AD^2 = AB^2 + BC^2 + CD^2$ prove that $\angle ACD = 90^\circ$.

35. In the given figure, D is the midpoint of side BC and $AE \perp BC$. If BC = a, AC = b, AB = c, ED = x, AD = p and AE = h, prove that :



$(i)\ b^2 = p^2 + ax + \frac{a^2}{4}$ $\quad (ii)\ c^2 = p^2 - ax + \frac{a^2}{4}$

$(iii)\left(b^2 + c^2\right) = 2p^2 + \frac{1}{2}a^2$ $\quad (iv)\left(b^2 - c^2\right) = 2ax$

Answers

1 Mark

1. 6cm
2. 8cm
3. ae
4. 90°
5. 4:5
6. ΔCBD
7. $\sqrt{2}MB$
8. $5\sqrt{5}cm$
9. 4.4cm
10. 4:1
11. -3
12. $\frac{1}{4}$
13. $6\sqrt{3}\,cm$
14. $3\sqrt{5}$
15. $10\left(\sqrt{2}+1\right)cm$
16. 2:1
17. Trapezium
18. 2
19. 5.4cm

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