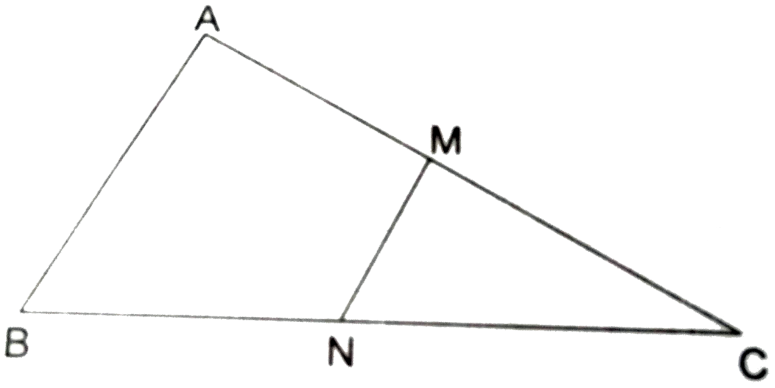
MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

TRIANGLES

Solved Examples

1. In the given figure, $MN \| AB$, $BC = 7.5cm$, $AM = 4cm$ and $MC = 2cm$. Find the length of BN.



A. 5 cm

B. 4cm

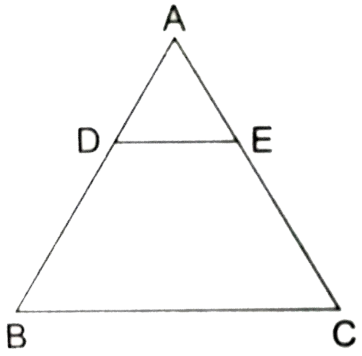
C. 6cm

D. 9cm

Answer: A

Watch Video Solution

2. In the given figure, $DE \| BC$ and $\frac{AD}{DB} = \frac{3}{5}$. If $AC = 4.8cm$, find the length of AE.



A. 2.8cm

B. $1.8cm$

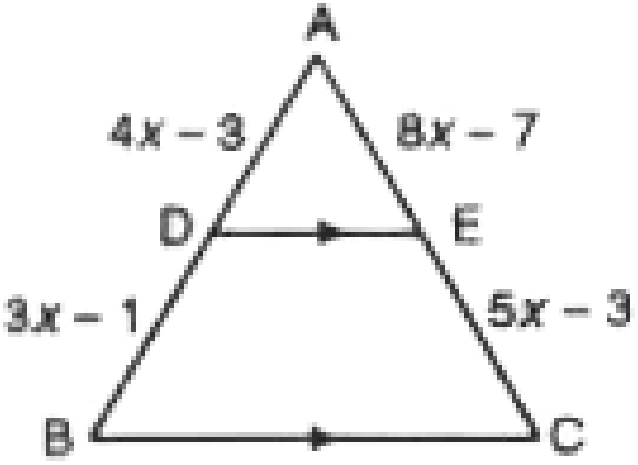
C. $3.8cm$

D. $4.8cm$

Answer: B

Watch Video Solution

3. In the given figure in $\Delta ABC, DE \| BC$ so that , $AD = (4x - 3)cm, AE = (8x - 7)cm, BD = (3x - 1)cm$ and $CE = (5x$. Find the value of x.



A. 1

B. 2

C. $\frac{-1}{2}$

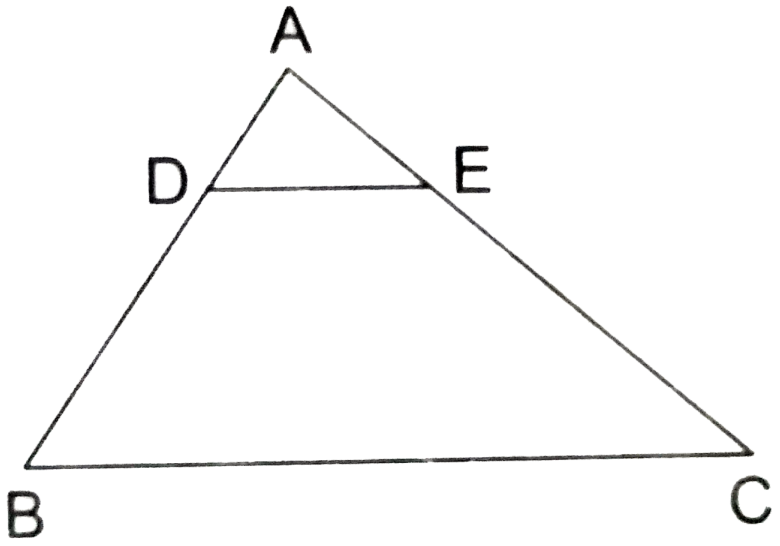
D. $\frac{1}{2}$

Answer: A

Watch Video Solution

4. If D and E are points on the sides AB and AC respectively of $DetlaABC$ such that $AB = 5.6cm$, $AD = 1.4cm$, $AC = 7.2cm$ and $AE = 1.8cm$.

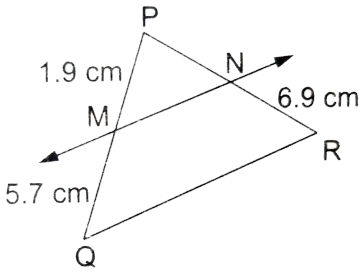
Show that $DE \| BC$.



Watch Video Solution

5. In the adjoining figure, $MN \| QR$.

Find (i) PN and (ii) PR.



A. 2.3cm , 9.2 cm

B. 5.3cm , 8.2 cm

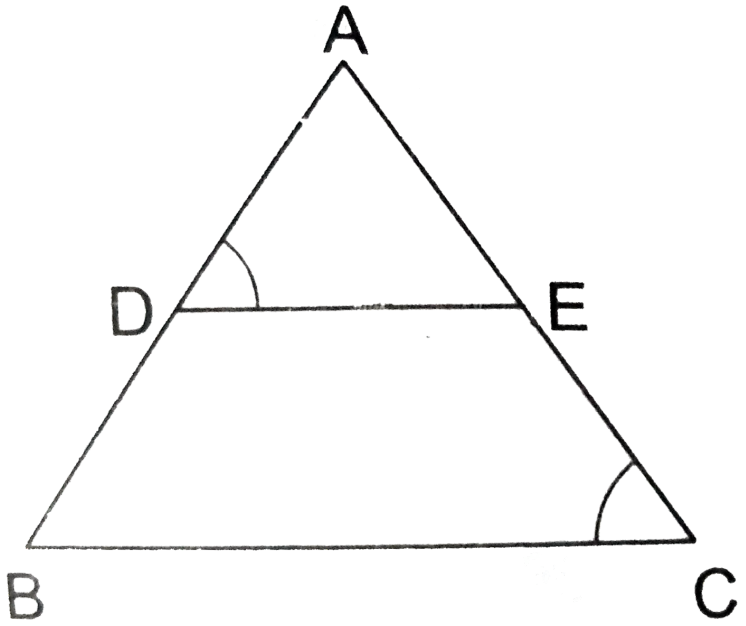
C. 4.5 cm , 6.6cm

D. 8.2 cm , 9.1`cm

Answer: A

Watch Video Solution

6. In the given figure, $\frac{AD}{DB} = \frac{AE}{EC}$ and $\angle ADE = \angle ACB$. Prove that ΔABC is an isosceles triangle.



Watch Video Solution

7. M and N are points on the sides AC and BC respectively of a ΔABC. In

ech of the fopllowing cases, state whether $MN \mid\mid AB$.

(i) $CM = 4.2cm.\ MA = 2.8cm,\ NB = 3.6cm,\ 5.7$

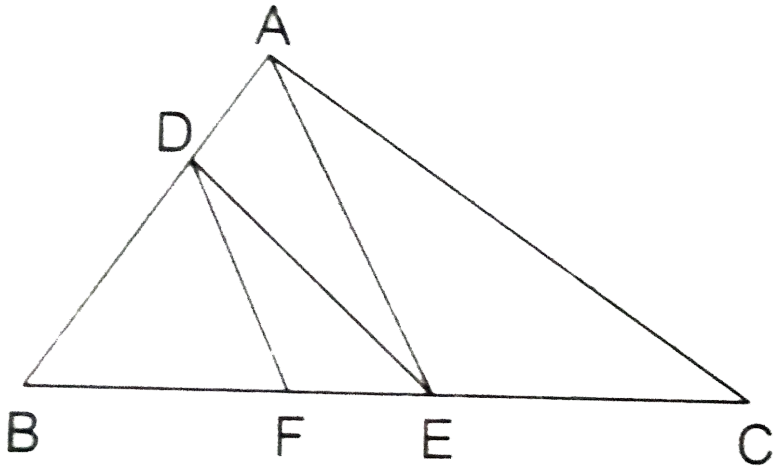
(ii) $CB = 6.92cm,\ CN = 1.04cm,\ Ca = 1.73cm,\ CM = 0.26cm$

(iii) $CM = 5.1cm,\ CA = 6.8cm,\ CB = 5.6cm,\ NB = 1.4cm.$

Watch Video Solution

8. In the given figure, $DE||AC$ and $DF||AE$.

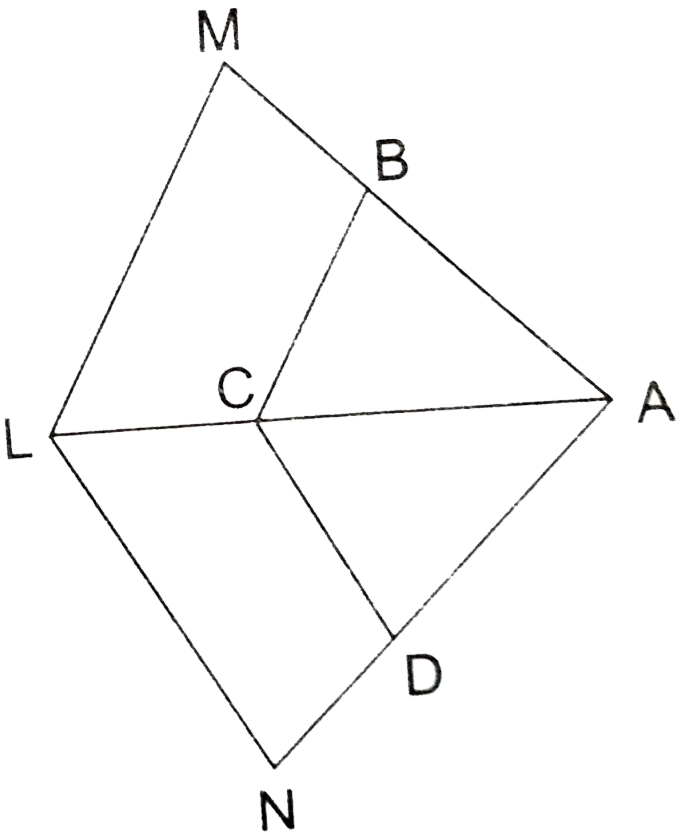
Prove that $\frac{BF}{FE} = \frac{BE}{EC}$



Watch Video Solution

9. In the given figure, $LM||CB||$ and $LN\ ||\ CD$.

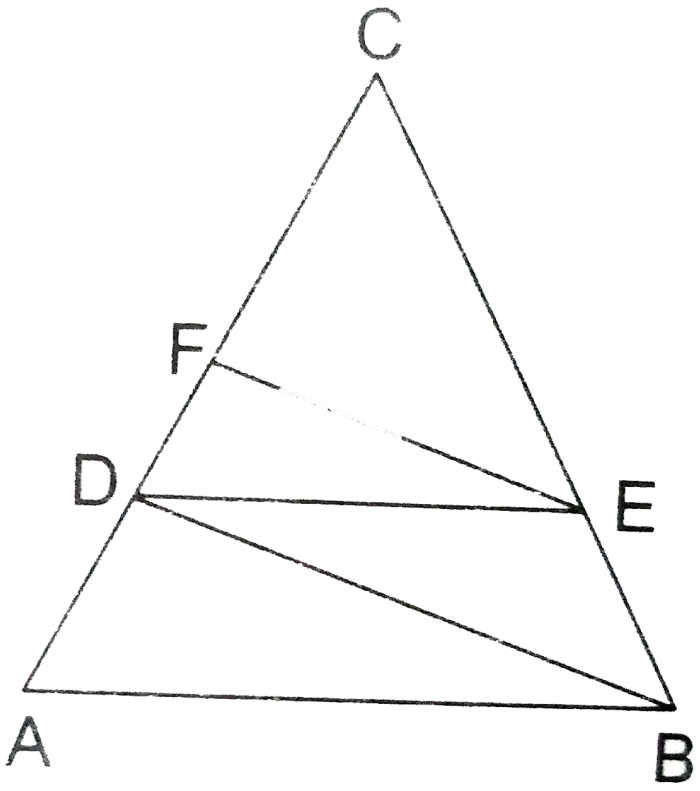
Prove that $\frac{AM}{AB} = \frac{AN}{AD}$



Watch Video Solution

10. It is given figure, $AB||DE||$ and $BD \mid \mid EF$.

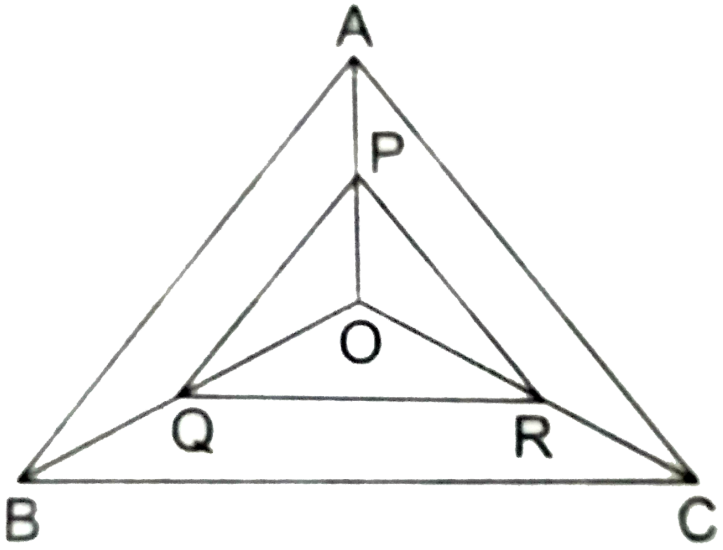
Prove that $DC^2 = CF \times AC$.



Watch Video Solution

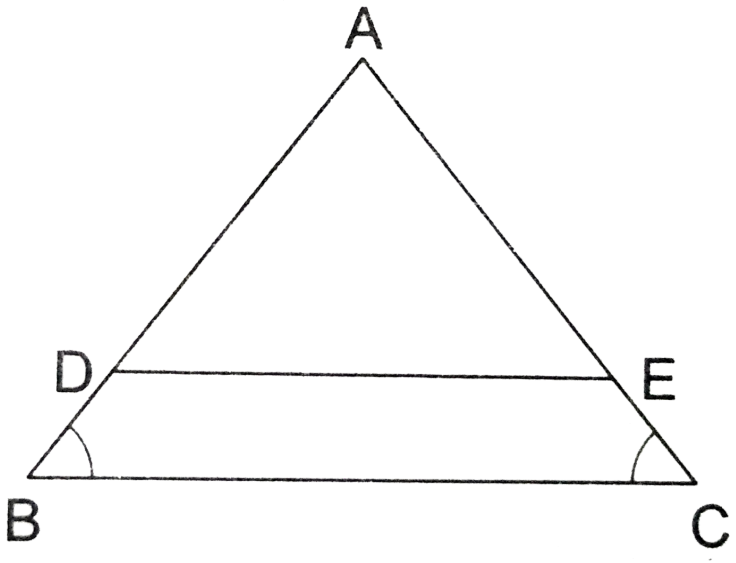
11. In the given figure, $PQ||AB$ and $PR||AC$.

Prove that $QR \mid\mid BC$



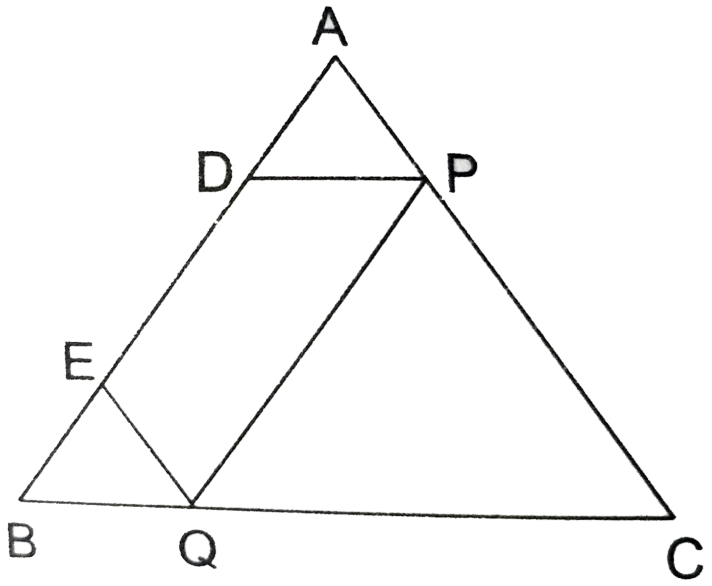
Watch Video Solution

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



Watch Video Solution

13. In $\Delta ABC, D$ and E two points on AB such that AD=BE. If $DP||BC$ and $EQ||AC$, prove that such $PQ \mid \mid AB$.



Watch Video Solution

14. If three or more parallel lines are intersected by two transversal; Prove that the intercepts made by them on transversal are proportional.

Watch Video Solution

15. $ABCD$ is a quadrilateral; $P, Q, RandS$ are the points of trisection of side $AB, BC, CDandDA$ respectively and are adjacent to $AandC$; prove that $PQRS$ is parallelogram.

Watch Video Solution

16. ABCD is a trapezium with AB || DC. E and F are points on non-parallel sides AD and BC respectively such that EF is parallel to AB. Show that $\frac{AE}{ED} = \frac{BF}{FC}$.

Watch Video Solution

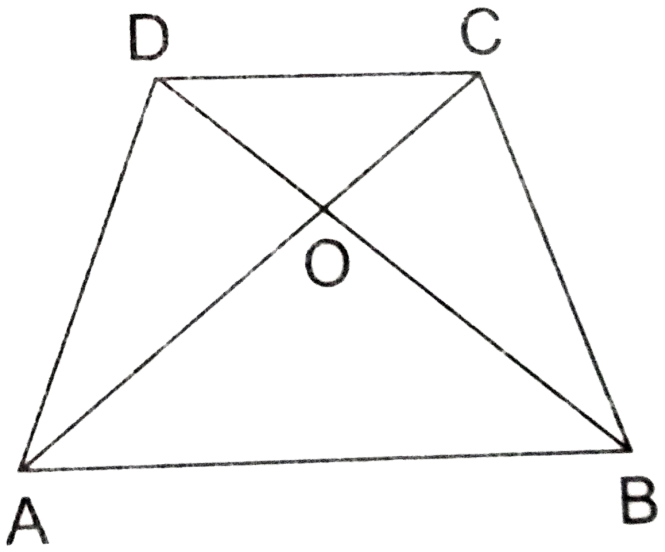
17. ABCD is a trapezium such that AB||CD. Its diagonals AC and BC intersect each other at O. Prove that $\frac{AO}{OC} = \frac{BO}{OD}$

Watch Video Solution

18. The diagonals of a quadrilateral ABCD intersect each other at the point O such that $\frac{AO}{BO} = \frac{CO}{DO}$. Show that ABCD is a trapezium.

Watch Video Solution

19. In the given figure, $ABCD$ is trapezium whose diagonals AC and BD intersect at O such that $OA = (3x - 1)cm$, $(OB = (2x + 1)cm$, $OC = (5x - 3)cm$ and $OD = (6$. Then, $x = ?$



A. 1 cm

B. 2cm

C. 3 cm

D. 4 cm

Answer: B

Watch Video Solution

20. The line segment joining the mid-points of any two sides of a triangle is parallel to the third side of a triangle.

Watch Video Solution

21. The line drawn from the midpoint of one side of a triangle parallel to another side bisects the third side.

Watch Video Solution

22. In ΔABC, E is the midpoint of the median AD. BE produced meets AC at F. Prove that $AF = \left(\frac{1}{3}\right)AC$

Watch Video Solution

23. Prove that the line segments joints joining the mid-points of the adjacent sides of a quadrilateral from a parallelogram.

Watch Video Solution

24. The internal angle bisector of an angle of a triangle divide the opposite side internally in the ratio of the sides containgthe angle

Watch Video Solution

25. In figure D is a point on side BC of a ΔABCsuch that $\frac{BD}{CD} = \frac{AB}{AC}$. Prove that AD is the bisector of $\angle BAC$.

Watch Video Solution

26. In the given figure, AD is the bisector of $\angle BAC$. If AB =10 cm , AC=6 cm and BC=12 cm, find BD and DC .

Watch Video Solution

27. If the bisector of an angle of a triangle bisects the opposite side, prove that the triangle is isosceles.

Watch Video Solution

28. If the diagonal BD of a quadrillateral ABCD bisects both $\angle B$ and $\angle D$. Prove that $\frac{AB}{BC} = \frac{AD}{CD}$.

Watch Video Solution

29. ΔAHK is similar to ΔABC. If AK = 10 cm, BC = 3.5 cm and HK = 7 cm, find AC.

A. 4cm

B. 5cm

C. 3cm

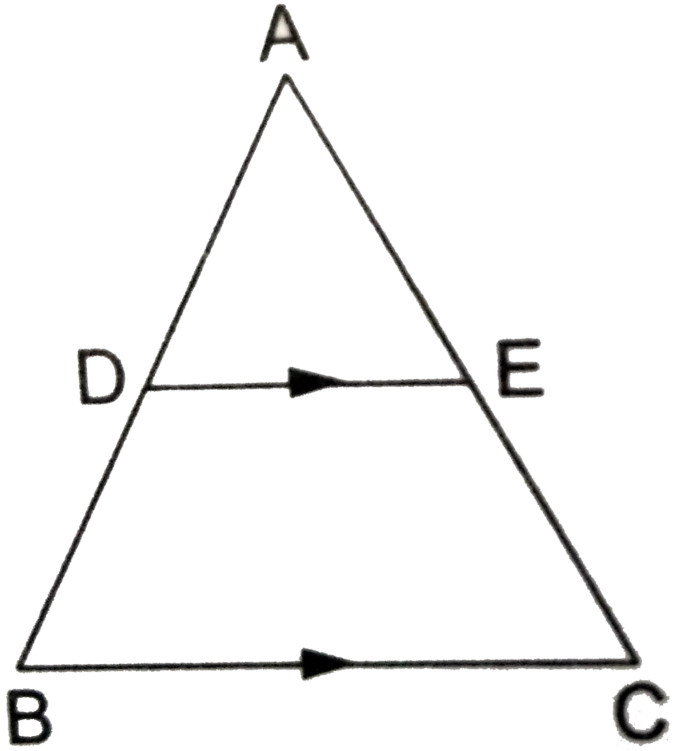
D. 2cm

Answer: B

Watch Video Solution

30. In the given figure, $DE||BC, AD = 2cm, BD = 2.5cm, AE = 3.2cm$ and $DE = 4cm.$

Find AC and BC.



Watch Video Solution

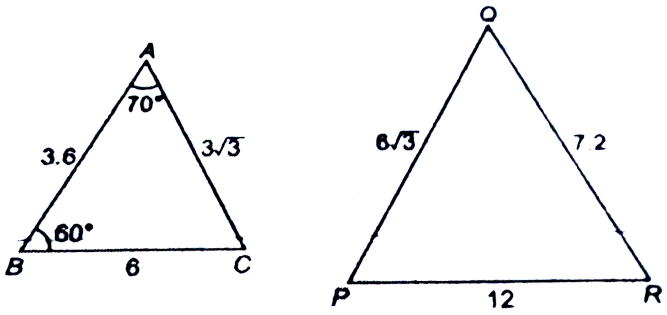
31. In the given figure , AB||CD . Prove that $\triangle AOB \sim \triangle DOC$.

Watch Video Solution

32. In the given figure , AB||CD . Prove that $\triangle AOB \sim \triangle DOC$.

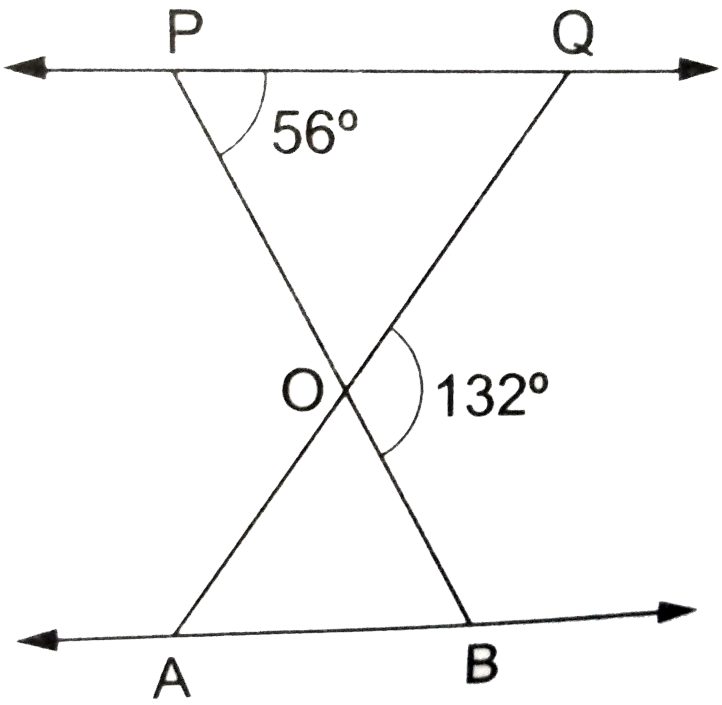
Watch Video Solution

33. Find $\angle P$ in the figure below.



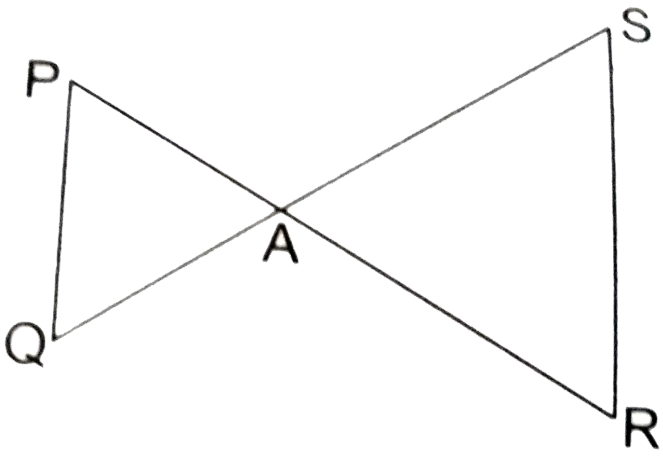
Watch Video Solution

34. In the given figure, $\Delta OQP \sim \Delta OAB, \angle OPQ = 56^\circ$ and $\angle BOQ = 132^\circ$. Find $\angle OAB$.



Watch Video Solution

35. In the given figure, $AP \cdot AR = AS \cdot AQ$ prove that $\angle P = \angle S$ and $\angle Q = \angle R$.



Watch Video Solution

36. A vertical stick which is 15 cm long casts a 12-cm long shadow on the ground. At the same time, a vertical tower casts a 50-m-long shadow on the ground. Find the height of the tower.

Watch Video Solution

37. If two triangles are similar; prove that the ratio of the corresponding sides is same as the ratio of corresponding medians.

Watch Video Solution

38. The perimeters of two similar triangles are 25cm and 15cm respectively. If one side of first triangle is 9cm, what is the corresponding side of the other triangle?

A. 2.4 cm

B. $3.4cm$

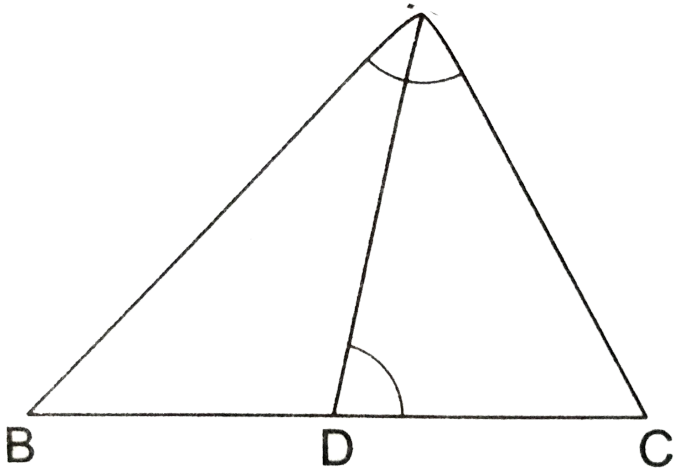
C. 4.4cm

D. 5.4cm

Answer: D

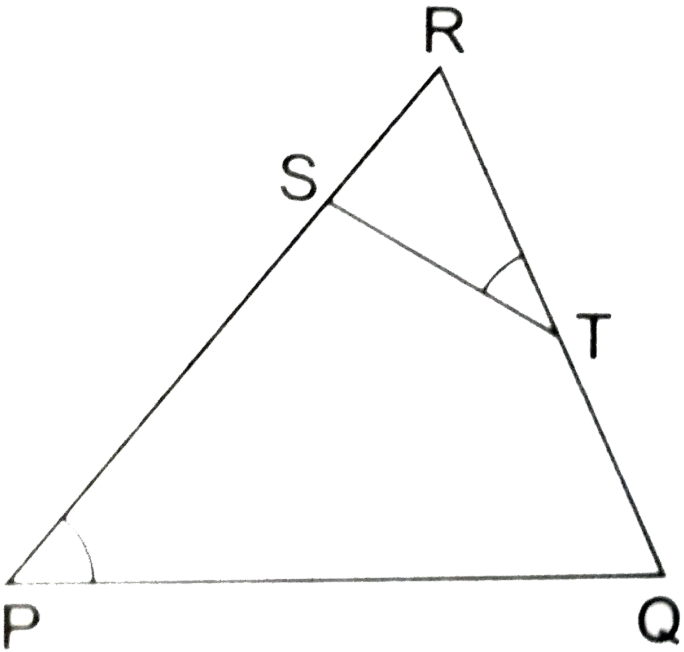
Watch Video Solution

39. In the given figure , D is a point on the side BC of ΔABC such that $\angle ADC = \angle BAC$. Prove that $CA^2 = CB \times CD$.



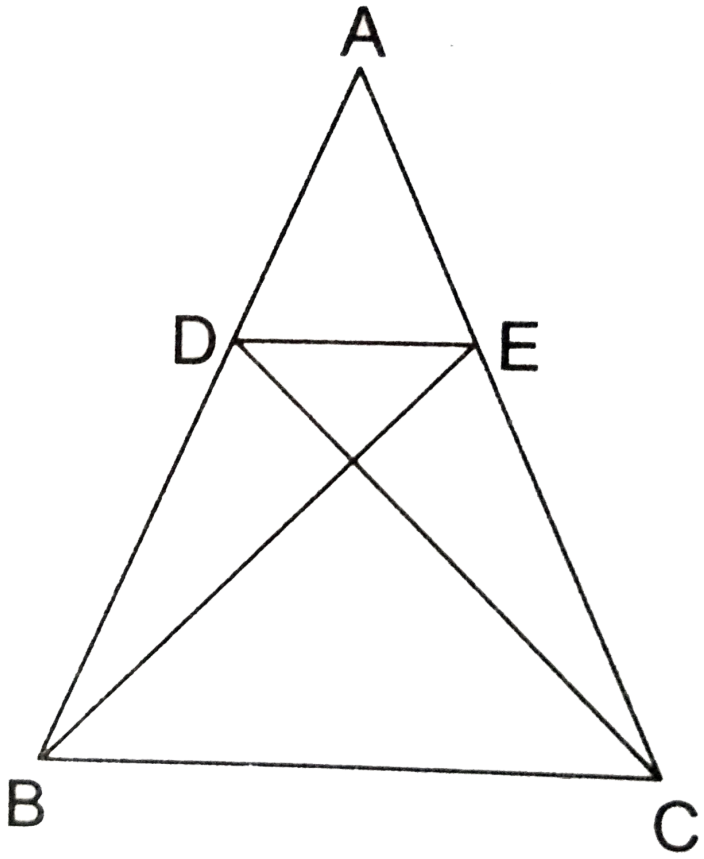
Watch Video Solution

40. In the given figure, S and T are points on sides PR and QR of ΔPQR such that $\angle P = \angle RTS$. Show that $\Delta RPQ \sim \Delta RTS$.



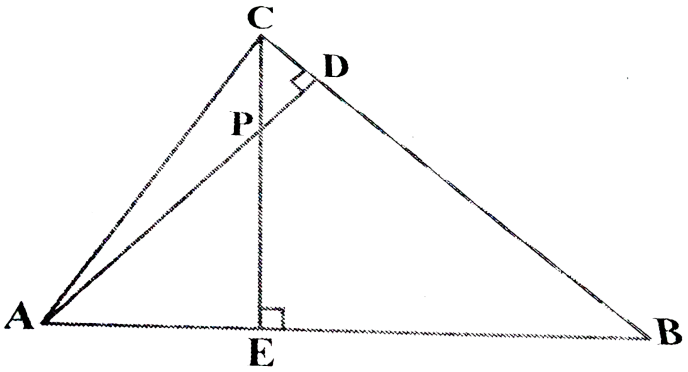
Watch Video Solution

41. In that figure, if $\Delta ABE \cong \Delta ACD$, show that $\Delta ADE \cong \Delta ABC$.



Watch Video Solution

42. In Figure altitudes AD and CE of DABC intersect each other at the point P. Show that: (i) $\Delta AEP \Delta CDP$ (ii) $\Delta ABD \Delta CBE$ (iii) $\Delta AEP \Delta ADB$ (iv) $\Delta PDC \Delta BEC$



Watch Video Solution

43. Diagonals AC and BD of a trapezium ABCD with AB || DC intersect each other at the point O. Using a similarity criterion for two triangles, show that $\frac{OA}{OC} = \frac{OB}{OD}$

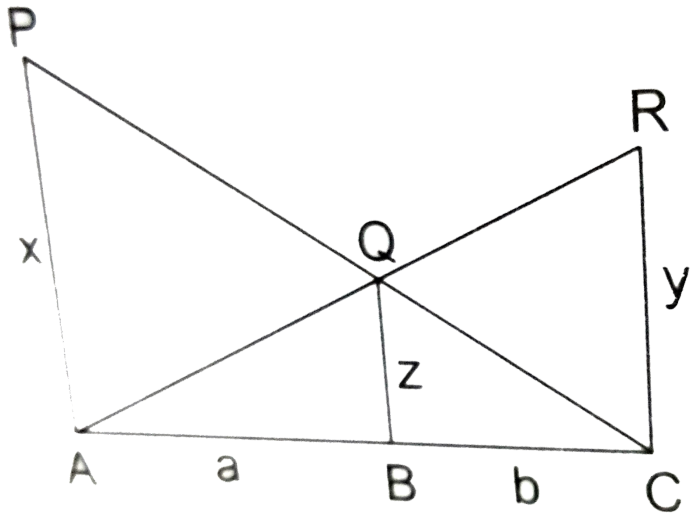
Watch Video Solution

44. In triangle ABC, if $AD \perp BC$ and $AD^2 = BD \cdot DC$. Then find the angle BAC

Watch Video Solution

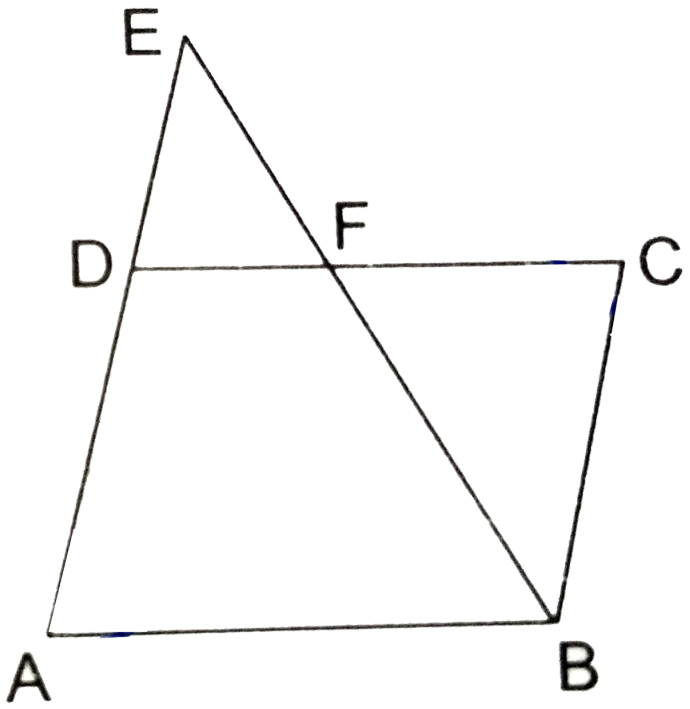
45. In the given figure, PA, QB and RC each is perpendicular to AC such that $PA = x, RC = y, QB = z, AB = a,$ and $BC = b$

Prove that $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$



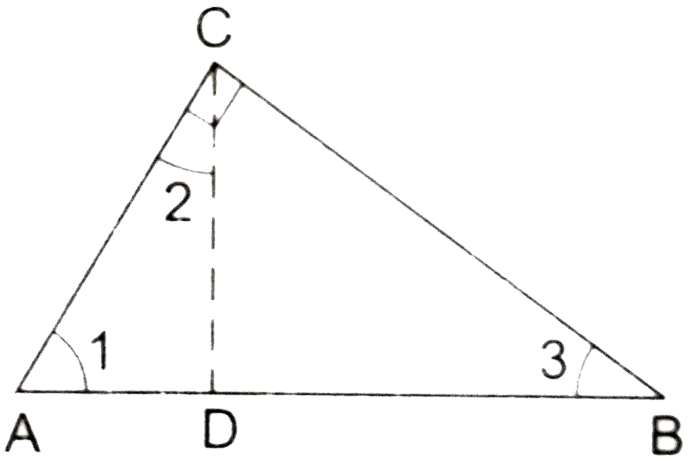
Watch Video Solution

46. The side AD of parallelogram ABCD is produced to a point E. BE intersects CD at F. Show that $\Delta ABE \sim \Delta CFB$.



Watch Video Solution

47. In the given figure, $\angle ACB = 90^\circ$ and $CD \perp AB$. Prove that $CD^2 = BD \cdot AD$

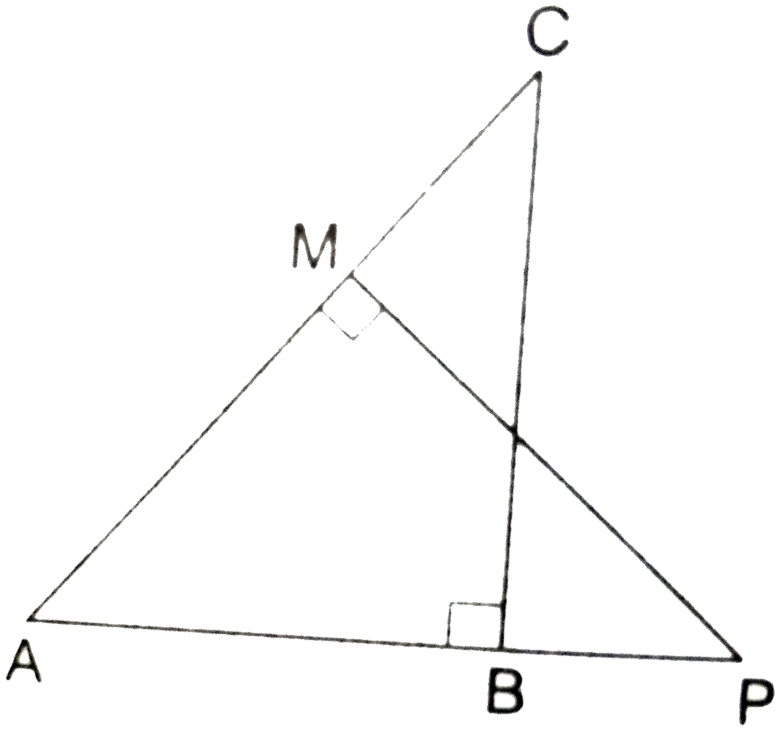


Watch Video Solution

48. In the given figure, ΔABC and ΔAMP are right- angled at B and M respectively.

Prove that (i) $\Delta ABC \approx \Delta AMP$

$(ii) \frac{CA}{PA} = \frac{BC}{MP}$



Watch Video Solution

49. ABC is a triangle in which $AB = AC$ and D is a point on AC such that $BC^2 = AC \times CD$.Prove that $BD = BC$.

Watch Video Solution

Watch Video Solution

50. In a $\triangle ABC$ P and Q are points on AB and AC respectively and PQ||BC. Prove that the median AD bisects PQ.

Watch Video Solution

51. In the given figure, E is a point on side CB produced of an isosceles ΔABC with $AB = AC$.. If $AD \perp BC$ and $EF \perp AC$, prove tha ΔABD~ΔECF

Watch Video Solution

52. Prove that the line segments joining the mid-points of the sides of a triangle from four triangles, each of which is similar to the original triangle.

Watch Video Solution

53. Two right triangles ABC and DBC are drawn on the same hypotenuse BC and on the same side of BC. If AC and BD intersect at P, prove that AP × PC = BP × PD.

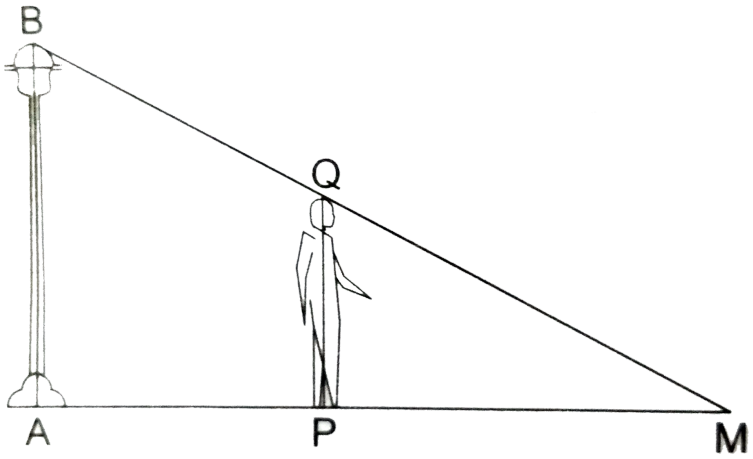
Watch Video Solution

54. Through the mid-point M of the side CD of a parallelogram $ABCD$, the line BM is drawn intersecting AC at $LandAD$ produced at E. Prove that $EL = 2BL$.

Watch Video Solution

55. A lamb is 3.3 m above the ground. A boy 110 cm tall walks away from the base of this lamp at a speed of 0.8 m/s. Find the length of the shadow

of the boy after 4 second.



A. 1.5m

B. 1.6m

C. 1.4`m

D. 1.3m

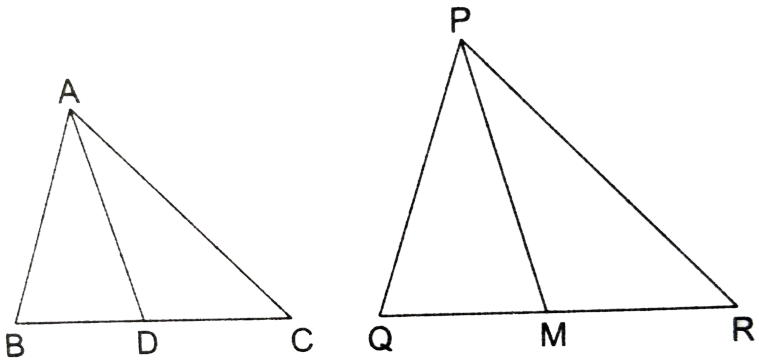
Answer: B

Watch Video Solution

56. Sides AB and BC and median AD of a triangle ABC are respectively proportional to sides PQ and QR and median PM of ΔPQR . Show that $\Delta ABC\Delta PQR$.

Watch Video Solution

57. Sides AB and AC and median AD of a triangle ABC are respectively proportional to sides PQ and PR and median PM of another triangle PQR. Prove that $\Delta ABC\sim DetlaPQR$



Watch Video Solution

58. If the area of two similar triangles are in the ratio $25:64$ find the ratio of their corresponding sides.

A. $5:4$

B. $3:5$

C. $5:8$

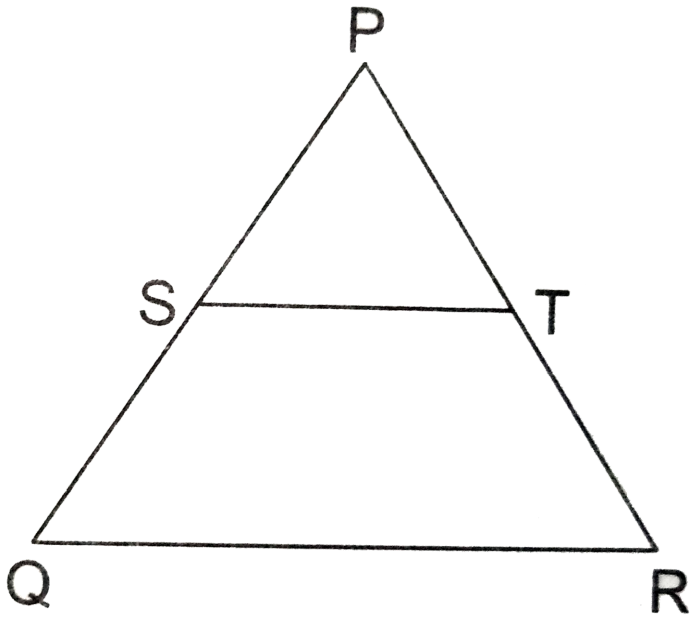
D. $6:7$

Answer: C

Watch Video Solution

59. In the adjoining figure, S and T are points on the sides PQ and PR respectively of ΔPQR such that $PT = 2cm, TR = 4cm$ and ST is

parallel to QR. Find the ratio of the ares ofΔPST and ΔPQR.



Watch Video Solution

60. The areas of two similar triangles ΔABC and ΔPQR are $25cm^2$ and $49cm^2$ respectively. If $QR = 9.8$ cm, find BC.

Watch Video Solution

61. The areas of two similar triangles are $81cm^2$ and $49cm^2$ respectively. If the altitude of the bigger triangle is 4.5 cm, find the corresponding altitude of the smaller triangle.

Watch Video Solution

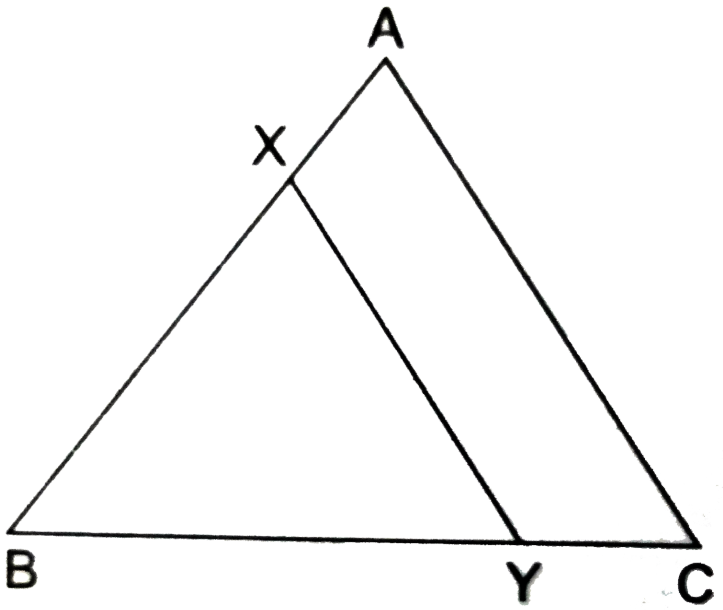
62. The areas of two similar triangles are $121\,cm^2$ and $64\,cm^2$ respectively. If the median of the first triangle is 12.1 cm, find the corresponding median of the other.

Watch Video Solution

63. $\Delta ABC \sim \Delta DEF$ in which AX and DY are the bisectors of $\angle A$ and $\angle D$ respectively . If $AX = 6.5cm$ and $DY = 5.2cm$, find the ratio of the areas of ΔABC and ΔDEF.

Watch Video Solution

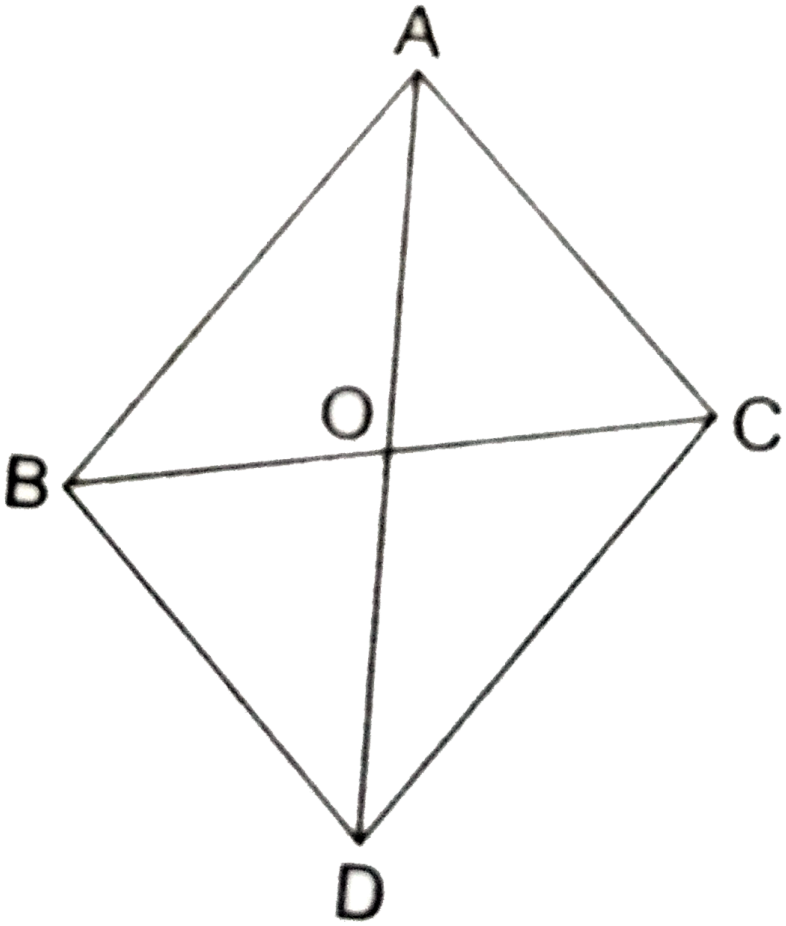
64. In the given figure, line the segment XY is parallel to side AC of ΔABC and it divides the triangles into two parts of equal area. Prove that $AX : AB = \left(2 - \sqrt{2}\right) : 2$



Watch Video Solution

65. In the same figure, ΔABC and ΔDBC are on the same base BC . If AD is intersects BC at O, prove that

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



Watch Video Solution

66. Diagonals of a trapezium $ABCD$ with $AB \| DC$ intersect each other at the point O. If $AB = 2CD$, find the ratio of the areas of

$\triangle AOB$ and $\triangle COD$.

A. $4:1$

B. $1:4$

C. $5:1$

D. $1:5$

Answer: A

Watch Video Solution

67. In a trapezium $ABCD$, O is the point of intesection of AC and BD, $AB \| CD$ and $AB = 2 \times CD$. If the area of $\triangle AOB = 84cm^2$. Find the area of $\triangle COD$.

A. $21cm^2$

B. $22cm^2$

C. $23cm^2$

D. $24cm^2$

Answer: A

Watch Video Solution

68. If D,E,F are the mid-points of the sides BC, Ca and AB respectively of a triangle ABC, prove by vector method that Area of ΔDEF = 1/4 Area of ΔABC

Watch Video Solution

69. Prove that the area of an equilateral triangle described on one side of a square is equal to half the area of the equilateral triangle described on one of its diagonals.

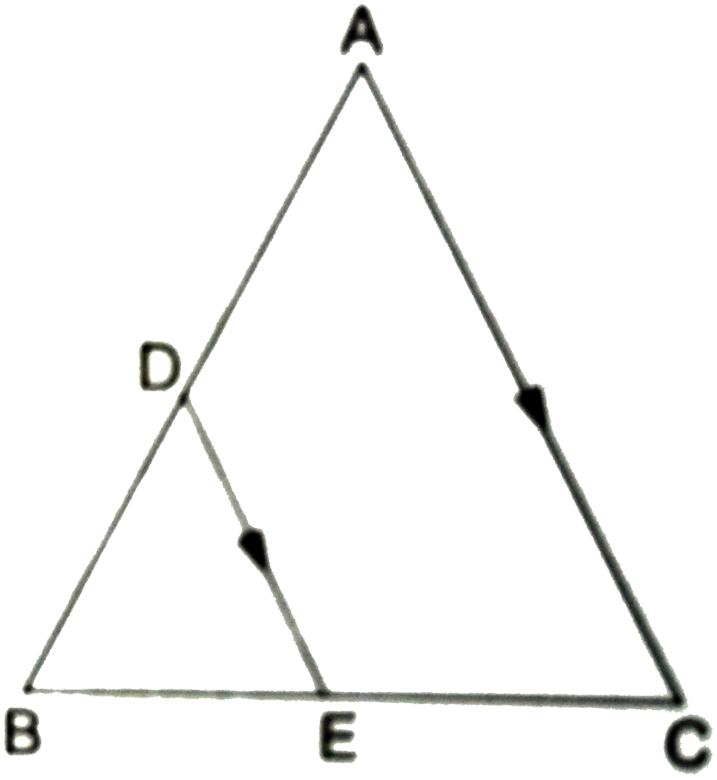
Watch Video Solution

70. Prove that the area of equilateral triangle described on the side of a square is half the area of the equilateral triangle described on its diagonal.

Watch Video Solution

71. If D is a point on the side AB of ΔABC such that $AD: BD = 3: 2$ and E is a point on BC such that $DE \| AC$, find the

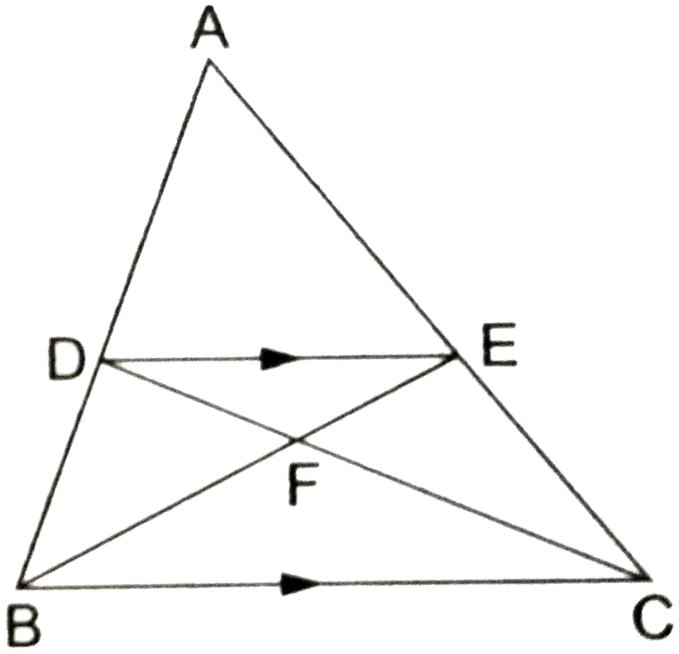
ratio of the areas of ΔABC and ΔDBE



Watch Video Solution

72. In the given figure $DE \mid\mid BC$ and $AD : DB = 5 : 4$

Find the ratio $ar(\Delta DEF) : ar(\Delta CFB)$



Watch Video Solution

73. Sides of some triangles are given below. Determine which of them are right triangles.

(i) $8cm, 15cm, 17cm$

(ii) $9cm, 11cm, 6cm$

(iii) $(2a-1)cm, 2\sqrt{2a}cm$ and $(2a+1)cm$

Watch Video Solution

74. A man goes 15 metres due west and then 8 metres due north. How far is he from the starting point?

Watch Video Solution

75. A ladder 25 m log just reaches the top of a building 24 m high from the ground. What is the distance of the foot of the ladder from the building ?

Watch Video Solution

76. A ladder $15m$ long reaches a window which is 9m above the ground on one side of a street. Keeping its foot at the same point, the ladder is turned to other side of the street to reach a window 12m high. Find the width of the street.

Watch Video Solution

77. Two poles of height 6 meters and 11 meteras stand vertically on a plane ground. If the distance between their feet is 12 meters. Find the distance between their tops.

Watch Video Solution

78. In a rhombus of side 10 cm, one of the diagonals is 12 cm long. The length of the second diagonals is

Watch Video Solution

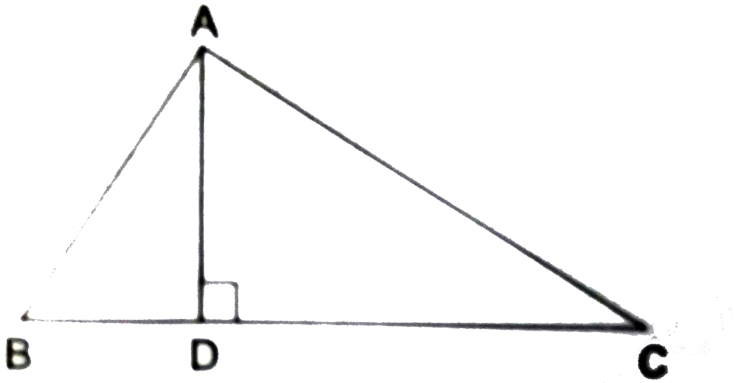
79. ΔABD is a right triangle, right-angled at A and $AC \perp BD$. Prove that $AB^2 = BC \times BD$.

Watch Video Solution

80. BL and CM are medians of a triangle ABC right angled at A. Prove that $4(BL^2 + CM^2) = 5BC^2$

Watch Video Solution

81. In the given figure, the of a ΔABC, interesects BC at D such $DB = 3CD$. Prove that $2AB^2 = 2AC^2 + BC^2$



Watch Video Solution

82. In a triangle $ABC, B = 90^\circ$ and D is the mid-point of BC then prove that $AC^2 = AD^2 + 3CD^2$

Watch Video Solution

83. In right-angled triangle ABC in which $\angle C = 90o$, if D is the mid-point of BC , prove that $AB^2 = 4\,AD^2 - 3\,AC^2$.

Watch Video Solution

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

Watch Video Solution

85. ABC is an isosceles right triangle, right-angled at C . Prove that: $AB^2 = 2AC^2.$

Watch Video Solution

86. ABC is an isosceles triangle with $AC = BC$. If $AB^2 = 2AC^2$, then ABC is a right angled at

Watch Video Solution

87. ABC is a right triangle right-angled at C. Let $BC = a$, $CA = b$, $AB = c$ and let p be the length of perpendicular from C on AB, prove that (i) $cp = ab$ (ii) $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$

Watch Video Solution

88. In an equilateral triangle, prove that three times the square of one side is equal to four times the square of one of its altitudes.

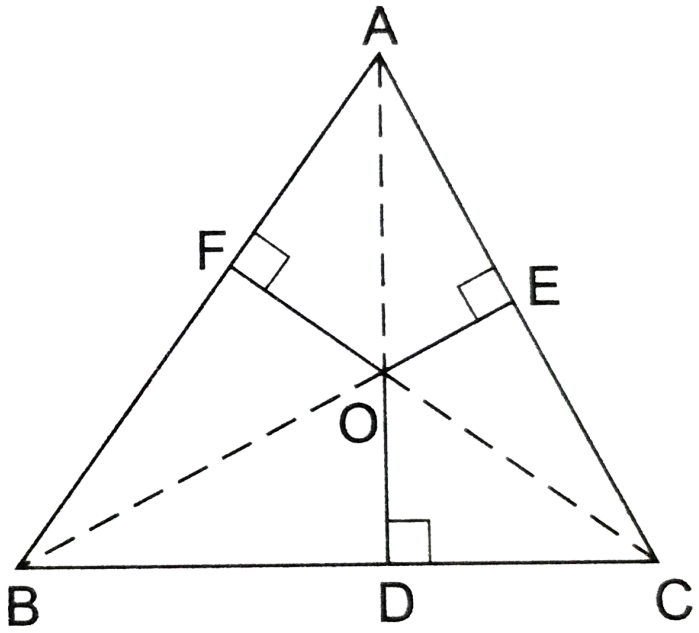
Watch Video Solution

89. In an equilateral triangle with side a , prove that (i) Altitude $= \frac{a\sqrt{3}}{2}$

(ii) Area $= \frac{\sqrt{3}}{4}a^2$

Watch Video Solution

90. O is a point in the interior of $\Delta ABC, OD \perp BC, OE \perp AC$ and $OF \perp AB$, as shown in the figure,



Prove that :

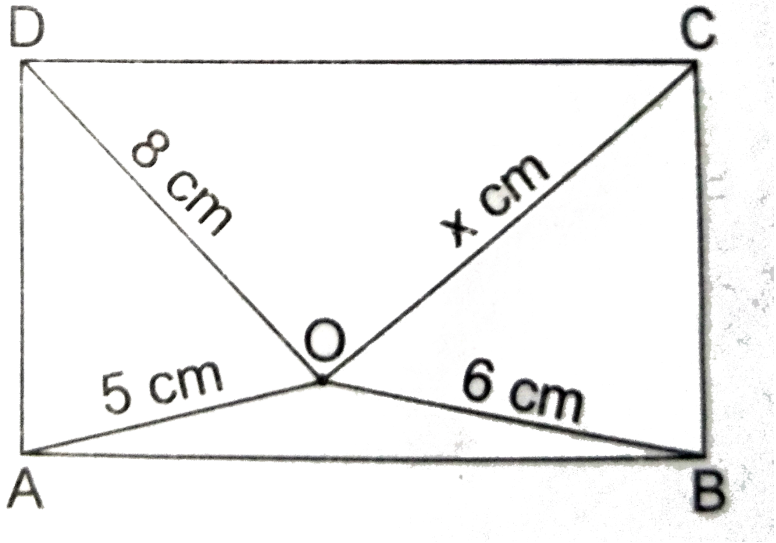
$(i) OA^2 + OB^2 + OC^2 - OD^2 - OE^2 - OF^2 = AF^2 + BD^2 + CE^2$

(ii) $AF^2 + BD^2 + CE^2 = AD^2 + BF^2 + CD^2$

Watch Video Solution

91. O is any point inside a rectangle ABCD. Prove that $OB^2 + OD^2 = OA^2 + OC^2$.

DEDUCTION In the given figure, O is a point inside a rectangle ABCD such that $OB = 6cm, OD = 8cm$ and $OA = 5cm$, find the length of OC.



Watch Video Solution

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

Watch Video Solution

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

Watch Video Solution

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

Watch Video Solution

95. In an isoscles ΔABC, $AB = AC$ and D is a point on BC. Prove that $AB^2 - AD^2 = BD \cdot CD$.

Watch Video Solution

Watch Video Solution

96. In an equilateral triangle ABC, D is a point on side BC such that $BD = \frac{1}{3}BC$. Prove that $9AD^2 = 7AB^2$.

Watch Video Solution

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

Watch Video Solution

98. Prove that the area of the semicircle drawn on the hypotenuse of a right-angled triangle is equal to the sum of the areas of the semicircles drawn on the other two sides of the triangle

Watch Video Solution

99. Given a right-angled $\triangle ABC$. The lengths of the sides containing the right angle are 6 cm and 8 cm. A circle is inscribed in $\triangle ABC$. Find the radius of the circle.

Watch Video Solution

100. Prove by vector method that the sum of the squares of the diagonals of a parallelogram is equal to the sum of the squares of its sides.

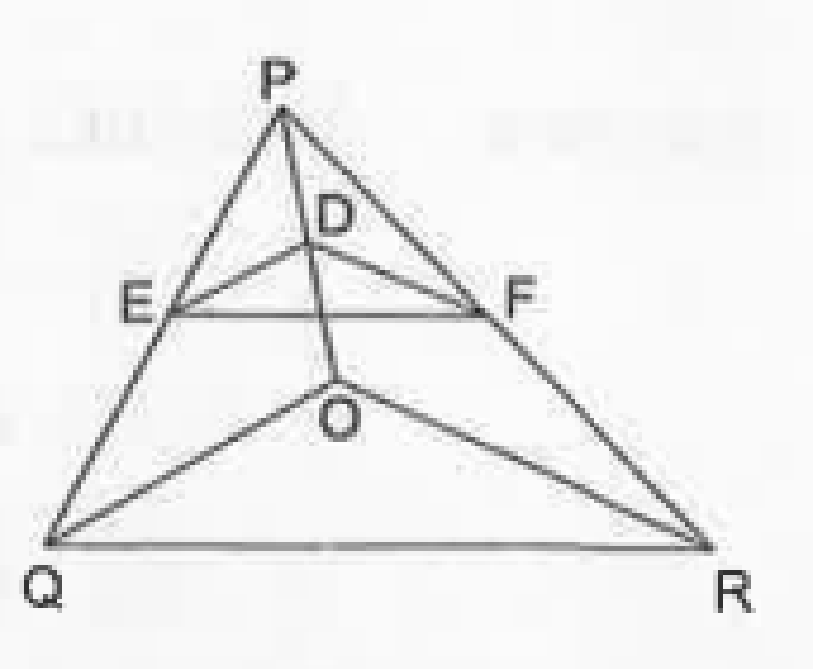
Watch Video Solution

101. Given $a\Delta ABC$ in which $\angle B = 90^\circ$ and $AB = \sqrt{3}BC$. Prove that $\angle C = 60^\circ$

Watch Video Solution

Solved Example

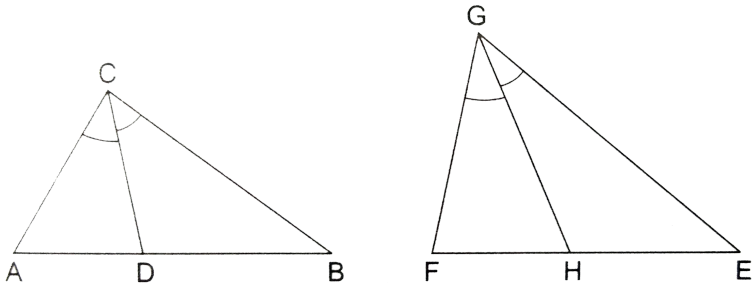
1. In the figue given along side, $DE||OQ$ and $DF||OR$. Show that $EF||QR$.



Watch Video Solution

2. In the given figure, CD and GH are respectively the bisectors of $\angle ACB$ and $\angle FGE$ofΔABC and ΔEFG respectively . If $\Delta ABC \sim \Delta FEG$, prove that :

(a) $\Delta ADC \sim \Delta FHG$ $(b) \Delta BCD \sim \Delta EGH$ $(c) \frac{CD}{GH} = \frac{AC}{FG}$



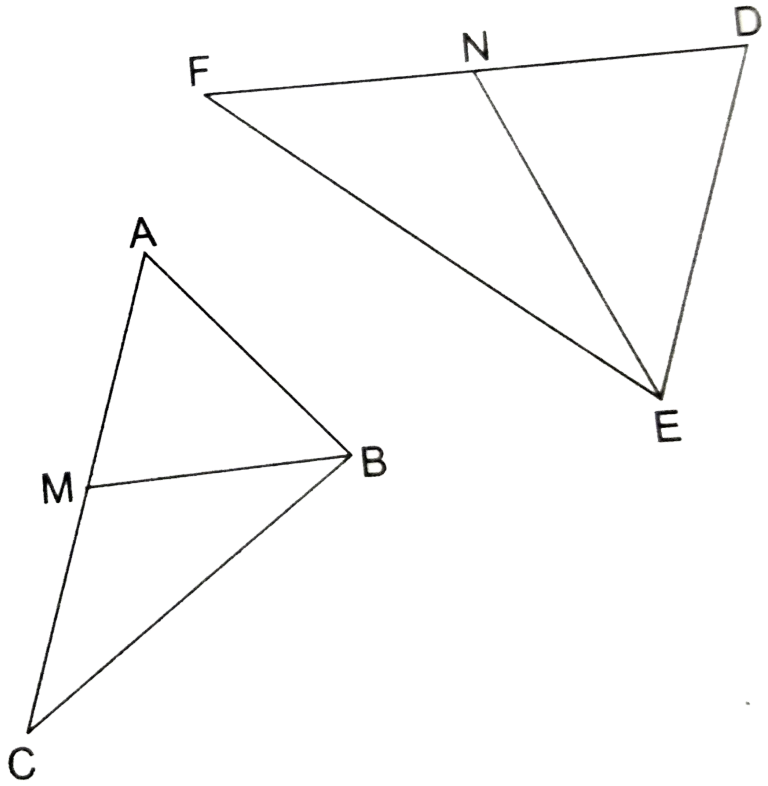
Watch Video Solution

3. In the given figure, BM and EN are respectively the medians of ΔABC and ΔDEF. If $\Delta ABC \sim \Delta DEF$, prove that:

(a) $\Delta AMB \sim \Delta DNE$

$(b) \Delta CMB \sim \Delta FNE$

(c) $\frac{BM}{EN} = \frac{AC}{DF}$



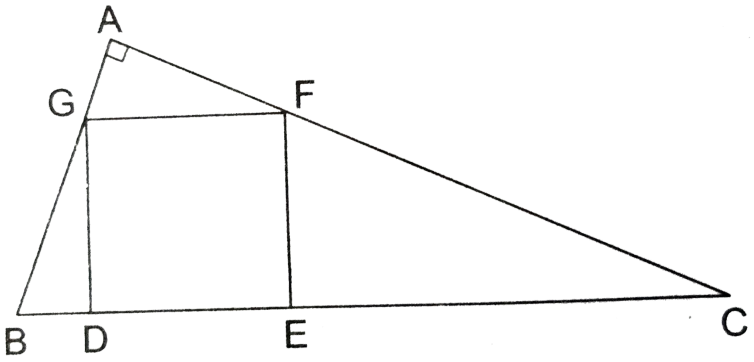
Watch Video Solution

4. In the given figure, DEFG is a square and $\angle BAC = 90^\circ$, Prove that

$(i) \Delta AGF \sim \Delta DBG$

(ii) $\Delta AGF \sim \Delta EFC$

$(iii) DE^2 = BD \times EC$



Watch Video Solution

Exercise 7 A

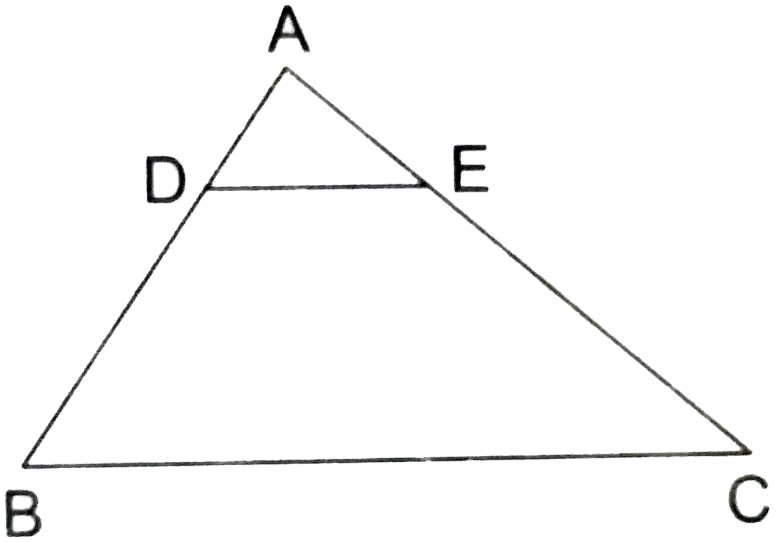
1. D and E are points on the sides AB and AC respectively of a ΔABC such that $DE \| BC$.

(i) If $AD = 3.6cm, AB = 10cm$ and $AE = 4.5cm,$ find EC and AC.

(ii) If $AB = 13.3cm, ac = 11.\ cm,$ and $EC = 5.1cm,$ find AD

(iii) If $\frac{AD}{DB} = \frac{4}{7}$ and $AC = 6.6cm,$ find AE.

(iv) If $\frac{AD}{AB} = \frac{8}{15}$ and $EC = 3.\ cm$, find AE.



Watch Video Solution

Exercise 7 A

1. D and E are points on the sides AB and AC respectively of a ΔABC such that $DE \| BC$.

Find the value of x, when

(i) $AD = xcm, DB = (x-2)cm,$

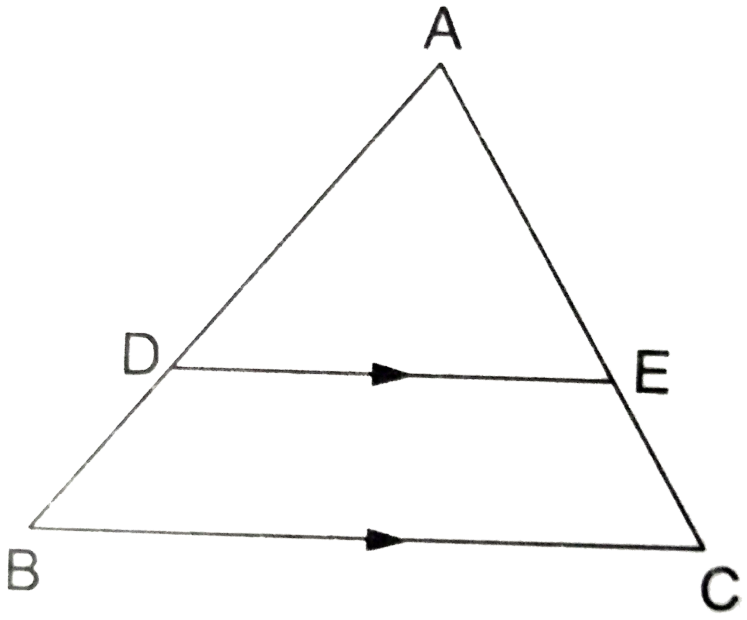
$AE = (x + 2)cm$ and $EC = (x - 1)cm$.

(ii) $AD = 4cm$, $DB = (x - 4)cm$, $AE = 8cm$

and $EC = (3x - 19)cm$.

$(iii) AD = (7x - 4)cm$, $AE = (5x - 2)cm$, $DB(3x + 4)cm$ and $EC = 3x$

.



Watch Video Solution

2. D and E are points on the sides AB and AC respectively of ΔABC. In each of the following cases, determine whetheer $DE \| \| BC$ or not. (i)

$AD = 5.7cm$, $DB = 9.5cm$, $Ae = 4.8cm$ and $EC = 8cm$. (ii)

$AB = 11.7cm$, $AC = 11.2cm$, $AD = 6.5cm$ and $AE = 41.2cm$, (iii)

$AB = 10.8cm$, $AD = 6.3cm$, $AC = 9.6cm$ and $EC = 4cm$. (iv)

$AD = 7.2cmAE = 6.4cm$. $AB = 12cm$ and $AC = 10cm$.

Watch Video Solution

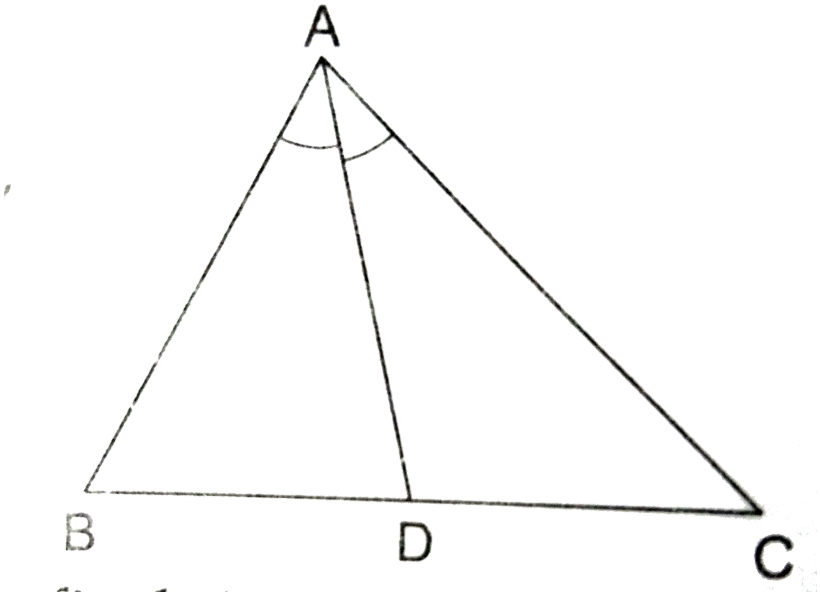
3. In a ΔABC, AD is the bisector of $\angle A$.

(i) If $AB = 6.4cm$, $AC = 8cm$ and $BD = 5.6cm$, find DC.

(ii) If $AB = 10cm$, $AC = 14cm$ and $BC = 6cm$, find BD and DC.

(iii) If $AB = 5.6cm$, $BD = 3.2cm$, and $BC = 6cm$, find AC.

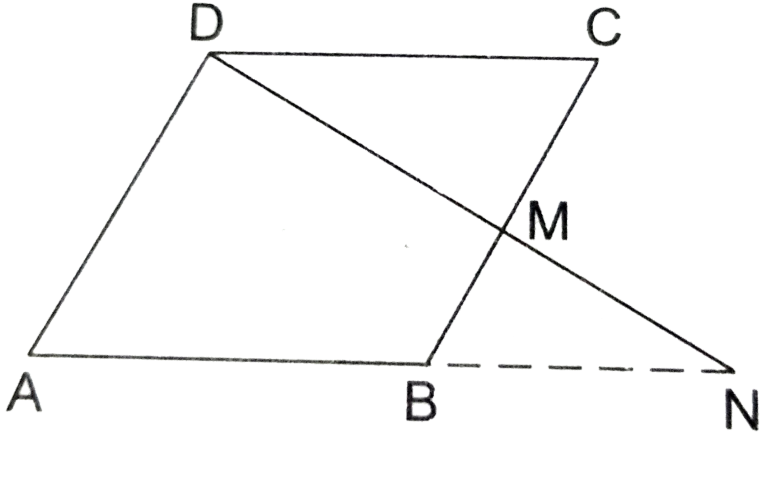
(iv) If $AB = 5.6cm$, $AC = 4cm$, and $DC3cm$, find BC.



Watch Video Solution

4. M is a point on the side BC of a parallelogram ABCD. DM when produced meets AB produced at N. Prove that

$(i)\frac{DM}{MN}=\frac{DC}{BN}$ $(ii)\frac{DN}{DM}=\frac{AN}{DC}$



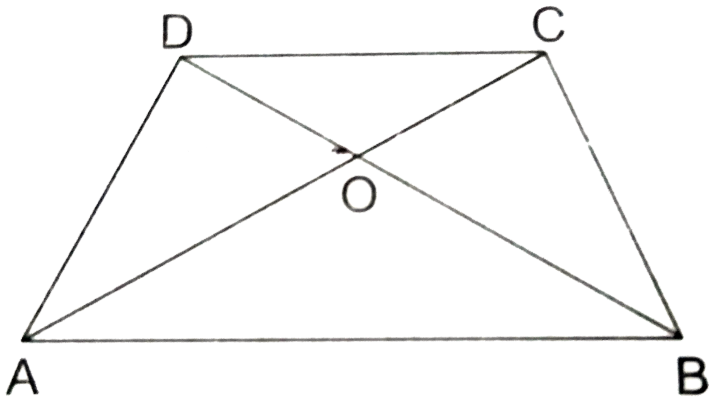
Watch Video Solution

5. Show that the line segment which joins the midpooints of the oblique sides of a trapesium is parallel to the sides.

Watch Video Solution

6. In the adjoining figure, ABCD is a trapezium in which $CD \| AB$ and its diagonals intersect at O. if $AO=(5x-7)cm, OC=(2x+1)cm, BO=(7x-5)cm$ and $OD=(7x$

, find the value of x.



Watch Video Solution

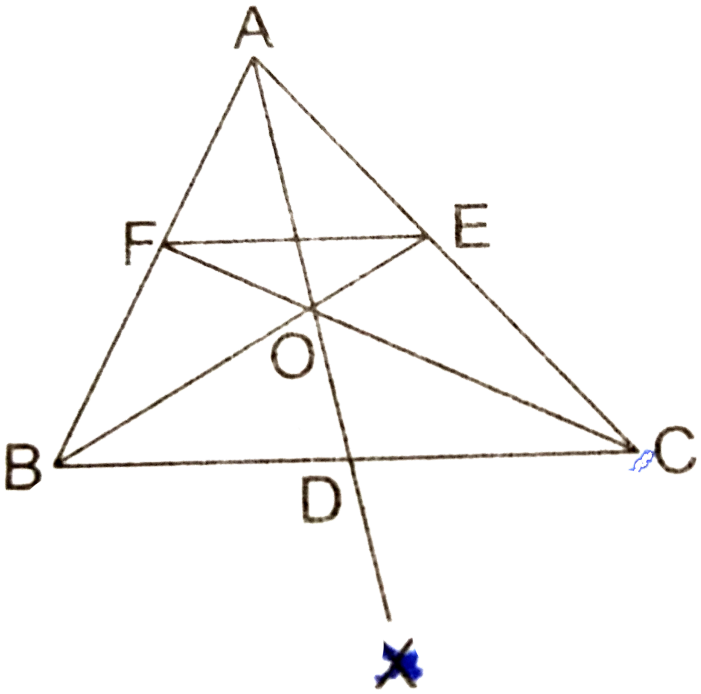
7. In ΔABC, M and N are points on the sides AB and AC respectively such that $BM = CN$. If $\angle A = \angle C$ then show that $MN \mid\mid BC$.

Watch Video Solution

8. ΔABC and ΔDBC lie on the same side of BC, show in the figure. From a point on BC. $PQ||AB$ and $PR||BD$ are drawn, meeting AC at Q, and CD at R respectively. Prove that $QR \mid\mid AD$.

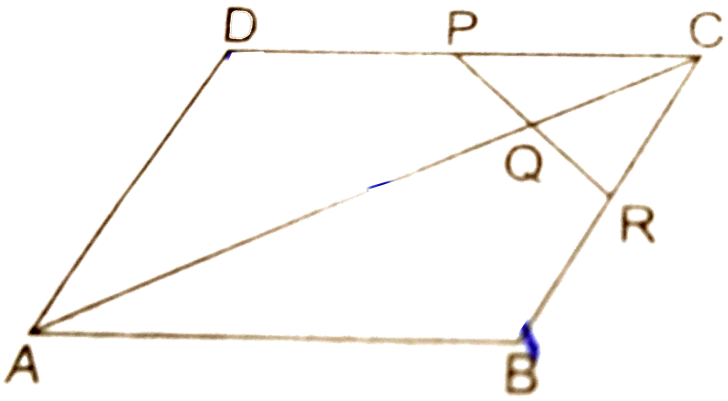
Watch Video Solution

9. In the given figure, side BC of ΔABC is bisected at D and O is any point AD.BO and CO produced meet AC and AB at E and F respectively, and AD is respectively, and AD is produced to X so that D is the midpoint of OX. Prove that $AO : AX = AF : AB$ and show that $EF \mid\mid BC$.



Watch Video Solution

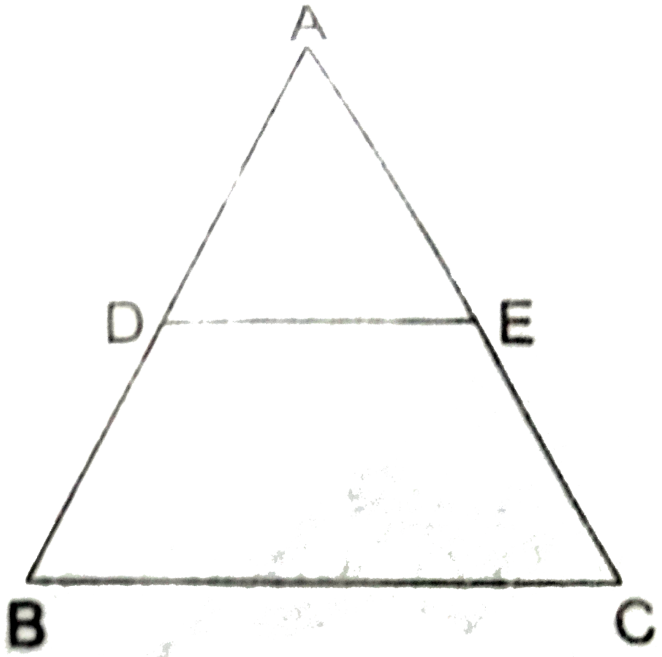
10. ABCD is a parallelogram in which P is the midpoint of DC and Q is a point on AC such that CQ $= \frac{1}{4}AC$. If PQ produced meets BC at R, prove that R is the midpoint of BC.



Watch Video Solution

11. In the adjoining figure, ABC is a triangle in whcich AB=AC. If D and E are poitns on AB and AC respecrtively such that AD=AE, show that the points

B,C,E and D are concyclic.



Watch Video Solution

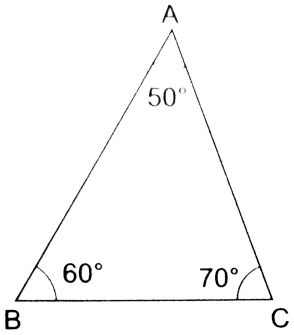
12. In ΔABC, the bisector of $\angle B$ meets AC at D. A line $PQ \mid\mid AC$ meets AB,BC and BD at P,Q and R respectively. Show that $BP \times QR = BQ \times PR$.

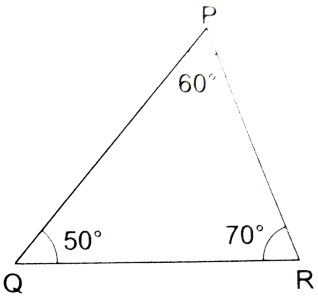
Watch Video Solution

Exercise 7 B

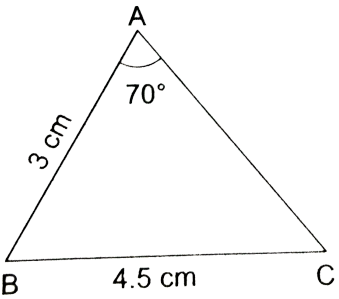
1. In each of the given pairs of triangles, find which pair of triangles are similar. State the similarity criterion and write the similarity relation in symbolic form.

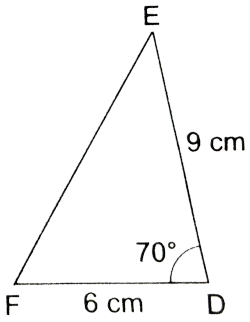
(i)



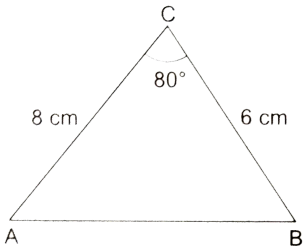


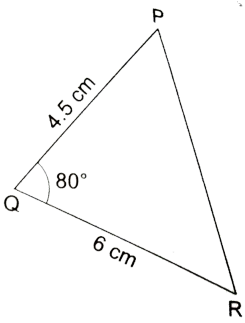
(ii)



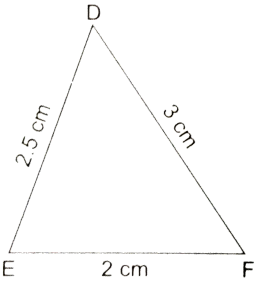


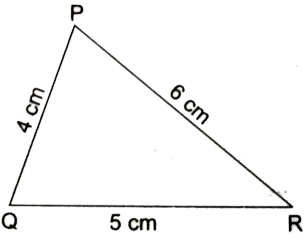
(iii)



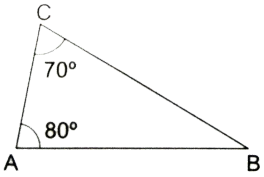


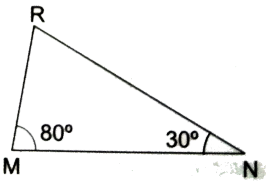
(iv)





(v)

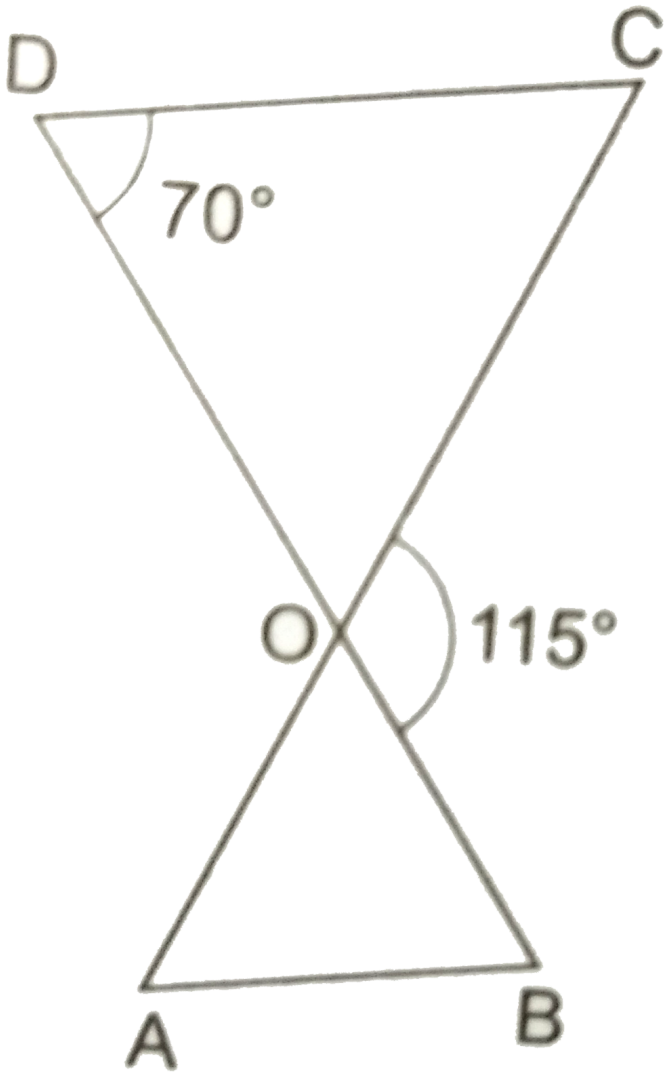




Watch Video Solution

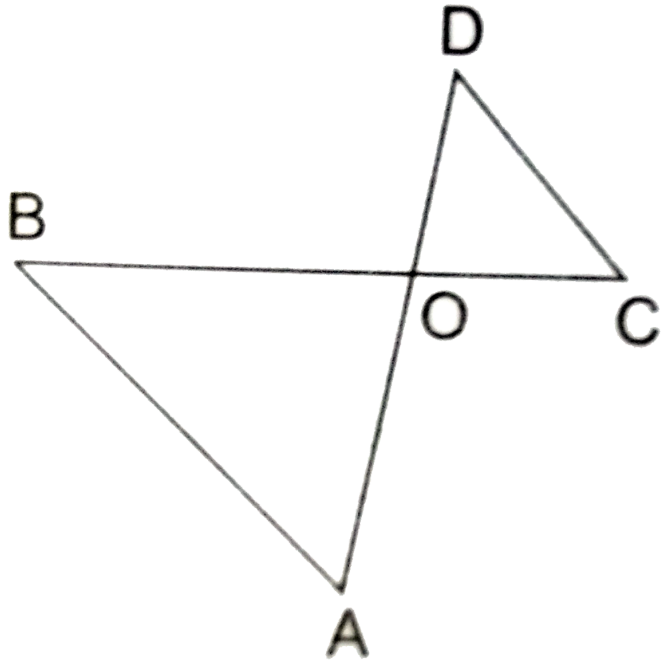
2. In the given figure, $\Delta ODC \sim \Delta OBA, \angle BOC = 115^\circ$ and $\angle COD = 70^\circ$

Find (i) $\angle DOC (ii) \angle DCO (iii) \angle OAB (iv) \angle OBA$



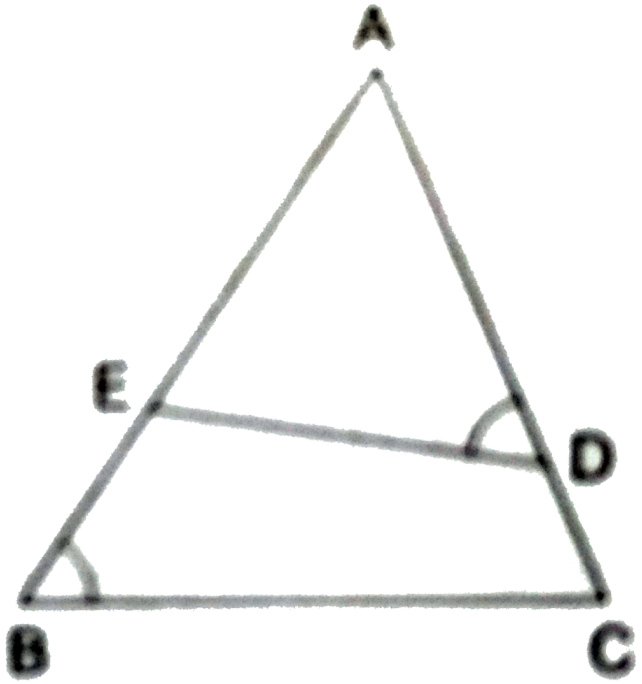
Watch Video Solution

3. In the given figure, $\Delta OAB \sim \Delta OCD$. If $AB = 8cm, BO = 6.4cm, OC = 3.5cm$ and $CD = 5cm$ find (i) OA (ii) DO.



Watch Video Solution

4. In the given figure, if $\angle ADE = \angle B$, show that $\Delta ADE \sim \Delta ABC$. If $AD = 3.8cm, AE = 3.6cm, BE = 2.1cm,$ and $BC = 4.2cm$, find DE.



Watch Video Solution

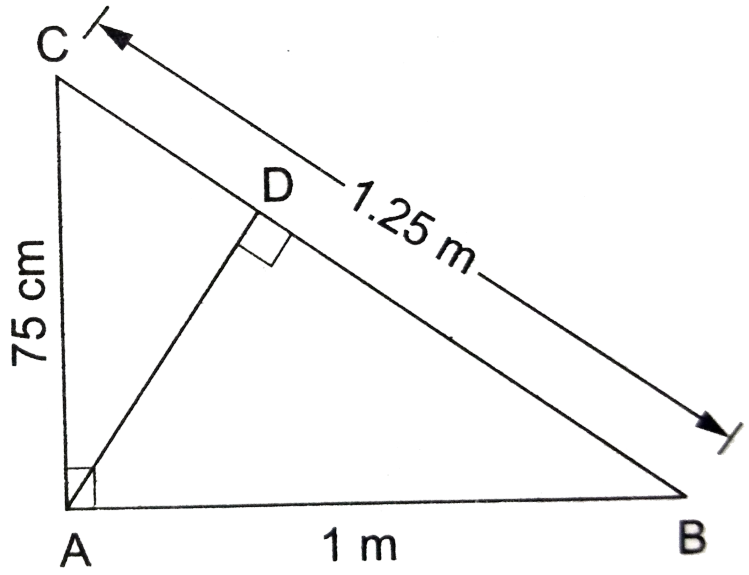
5. The perimetes of two similar triangles ABC and PQR are 32 cm and 24 cm respectively. If PQ=12 cm, find AB.

Watch Video Solution

6. The corresponding sides of two similar triangles ABC and DEF are $BC = 9.1cm,$ and $EF = 6.5cm.$ If the perimete of ΔDEF is 25 cm, find the perimeter of $\Delta ABC.$

Watch Video Solution

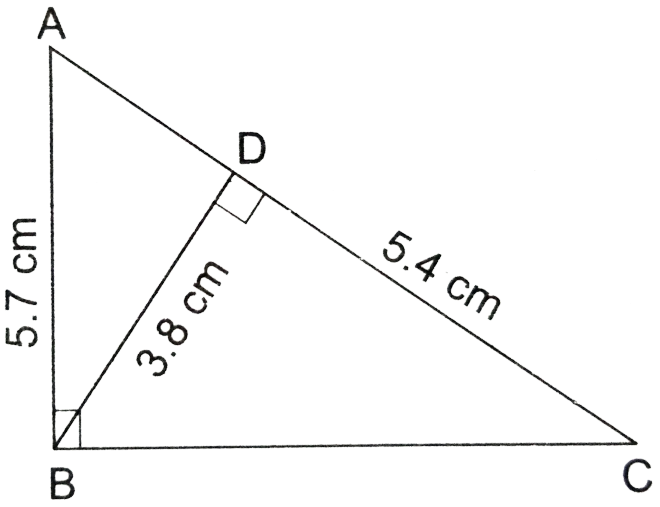
7. In the given figure, $\angle CAB = 90^\circ$ and $AD \perp BC.$ Show that $\Delta BDA \sim \Delta BAC.$ if $AC = 75cm, AB = 1m$ and $BC = 1.25cm,$ find AD.



Watch Video Solution

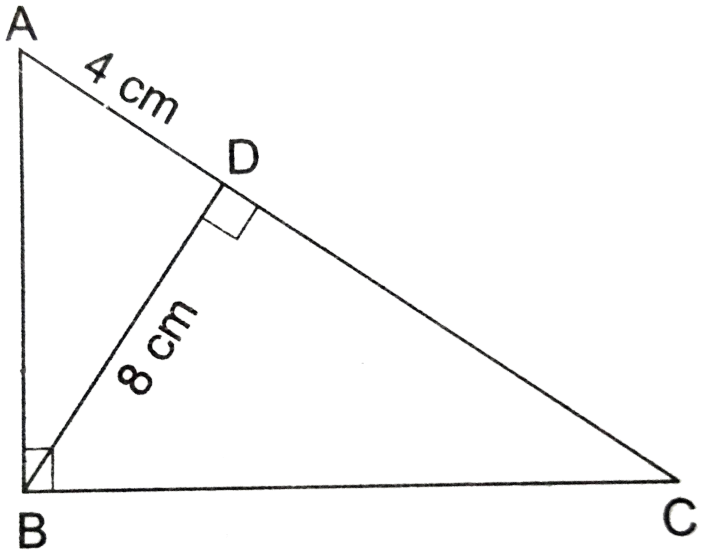
Watch Video Solution

8. In the given figure, $\angle ABC = 90^\circ$ and $BD \perp AC$. If $AB = 5.7cm$, $BD = 3.8cm$ and $CD = 5.4cm$, find BC.



Watch Video Solution

9. In the given figure, $\angle ABC = 90^\circ$ and $BD \perp AC$. If $BD = 8cm$, $AD = 4cm$ find CD.

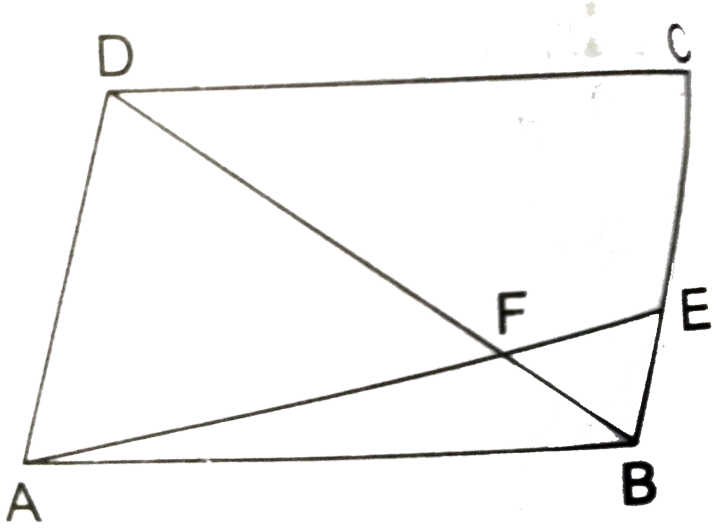


Watch Video Solution

10. P and Q are points on the sides AB and AC respectively of a $\triangle ABC$. If AP= 2cm, PB = 4cm AQ= 3cm and QC= 6cm. Show that BC= 3PQ.

Watch Video Solution

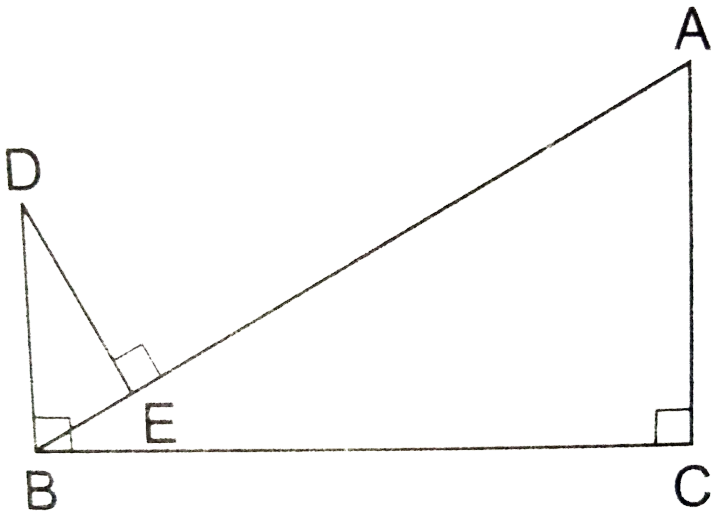
11. ABCD is a parallelogram and E is a point, on BC. If the diagonal BD intersects AE at F, prove that $AF \times FB \times EF \times FD$.



Watch Video Solution

12. In the given figure, $DB \perp BC$, $DE \perp AB$ and $AC \perp BC$.

Prove that $\frac{BE}{DE} = \frac{AC}{BC}$



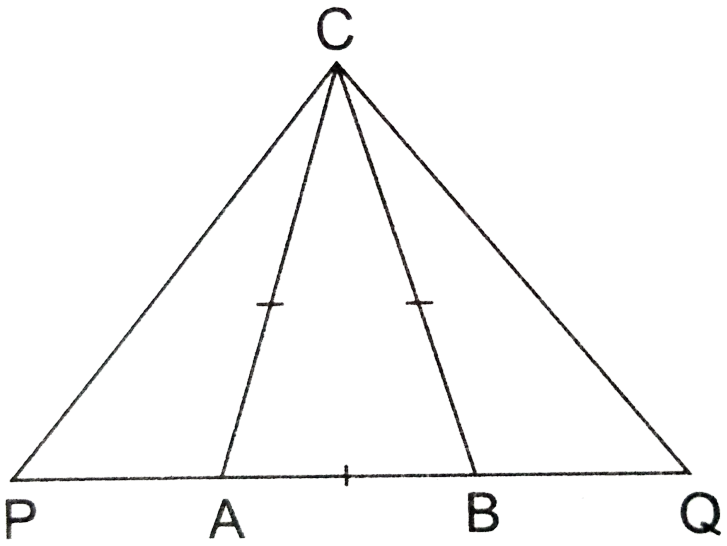
Watch Video Solution

13. A vertical pole of length $7.5m$ casts a shadow 5 long on the ground and at the same time a tower casts a shadow 24 m long. Find the height of the tower.

Watch Video Solution

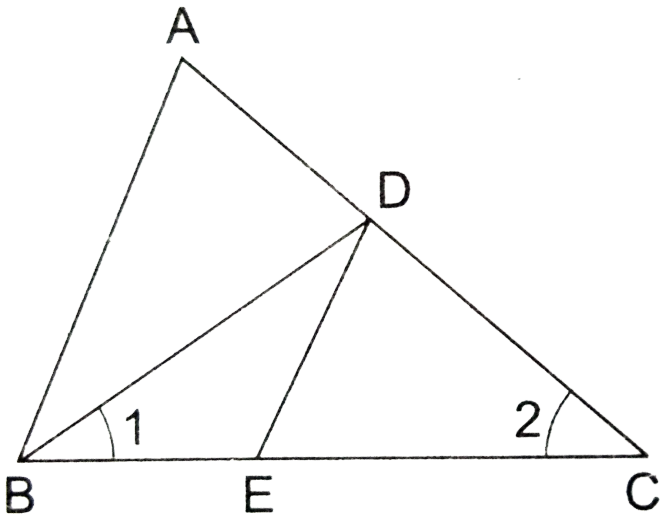
14. In an isosceles ΔABC, the base AB is produced both wasys in P and Q such that $AP \times BQ = AC^2$

Prove that $\Delta ACP \sim \Delta BCQ$.



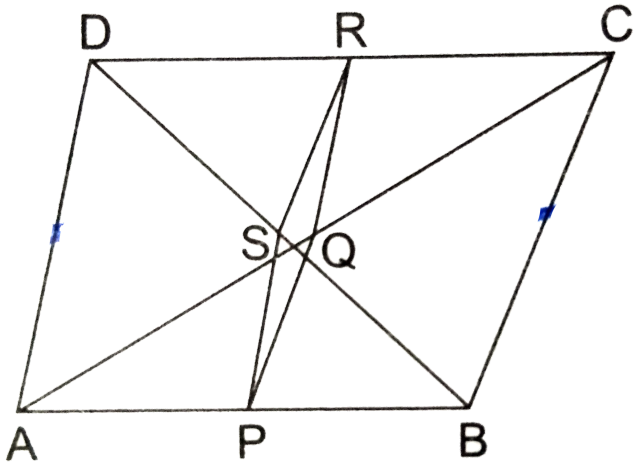
Watch Video Solution

15. In the given figure, $\angle 1 = \angle 2$ and $\frac{AC}{BD} = \frac{CB}{CE}$ prove that $\Delta ACB \sim \Delta DCE$.



Watch Video Solution

16. ABCD is a quadirlateral in which AD= BC. If P,Q,R,S be the midpoints of AB,AC,CD and BD respectively, show that PQRS is a rhombus.

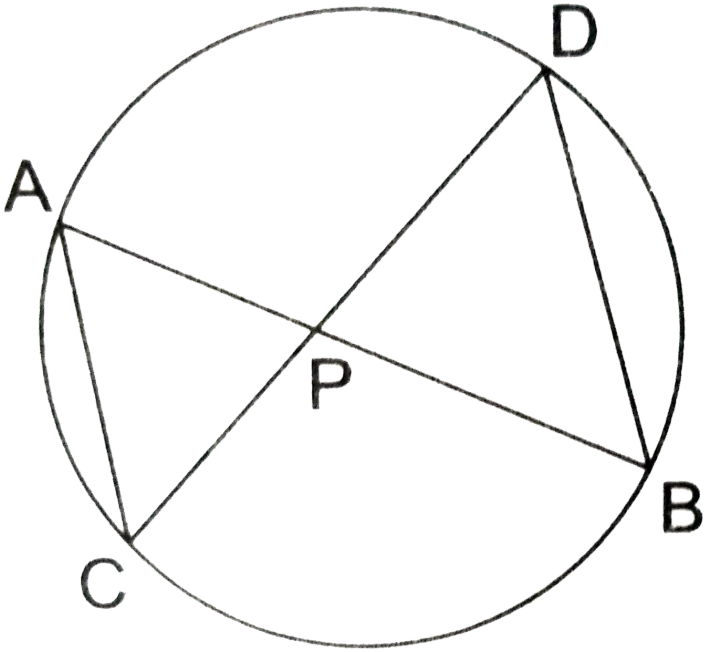


Watch Video Solution

17. In a cricle, two chords AB and CD intersect at a point P inside the circle.

Prove that

$(a) \Delta PAC \sim \Delta PDB \qquad (b) PA \cdot PB = PC \cdot PD.$

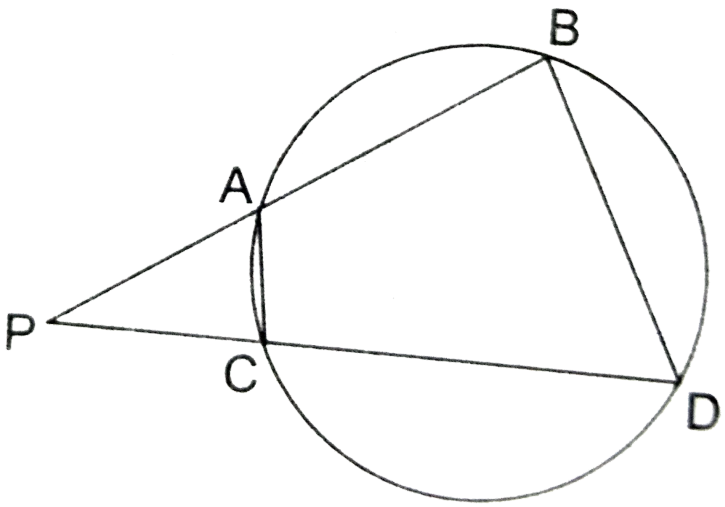


Watch Video Solution

18. Two chords AB and CD of a circle intersect at a point outside the circle.

Prove that

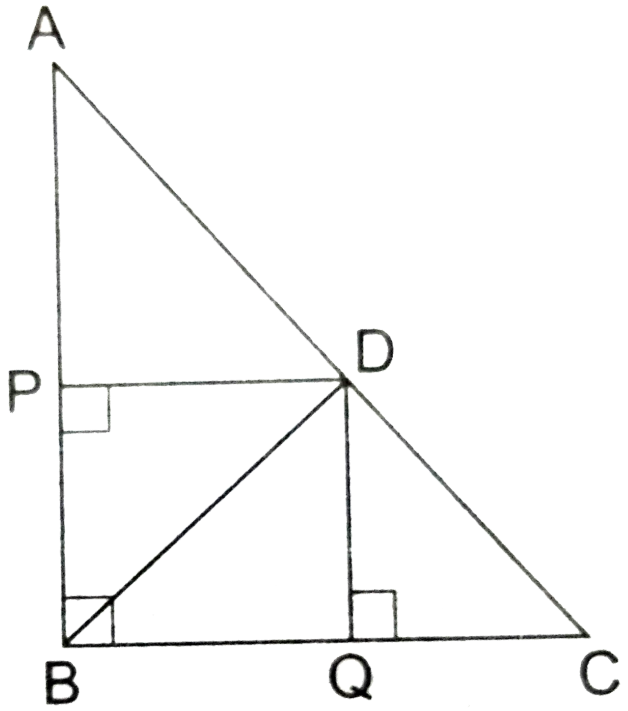
$(a)\Delta PAC \sim \Delta PDB \qquad (b)PA \cdot PB = PC \cdot PD.$



Watch Video Solution

19. In a right tringle ABC, right-angled at B, D is a point on hypotenuse such that $BD \perp AC$. If $DP \perp AB$ and $DQ \perp BC$ then prove that

$(a) DQ^2 = DP \cdot QC \qquad DP^2 = DQ \cdot AP.$



Watch Video Solution

Exercise 7 C

1. The areas of two similar $\triangle ABC$ and $\triangle PQR$ are 64 sq. cm and 121 sq. cm. repsectively. If QR= 15.4 cm, find BC.

Watch Video Solution

2. The areas of two similar triangles ABC and PQR are in the ratio $9:16$. If $BC = 4.5cm$, find the length of QR.

Watch Video Solution

3. $\Delta ABC \sim \Delta PQR$ and $ar(\Delta ABC) = 4ar(\Delta PQR)$, If $BC = 12cm$ then find QR

A. $7cm$

B. $8cm$

C. $10cm$

D. $6cm$

Answer: D

Watch Video Solution

4. The areas of two similar triangles are $169\,cm^2$ and $121\,cm^2$ respectively. If the longest side of the larger triangle is $26cm$, what is the length of the longest side of the smaller triangle?

A. 39 cm

B. 25 cm

C. 22 cm

D. 21 cm

Answer: C

Watch Video Solution

5. $\Delta ABC \sim \Delta DEF$ and their areas are respectively $100cm^2$ and $49cm^2$. If the altitude of ΔABC is 5 cm find the correspoding altitude of ΔDEF. \

Watch Video Solution

6. The corresponding altitudes of two similar triangles are 6 cm and 9 cm respectively. Find the ratio of their areas.

Watch Video Solution

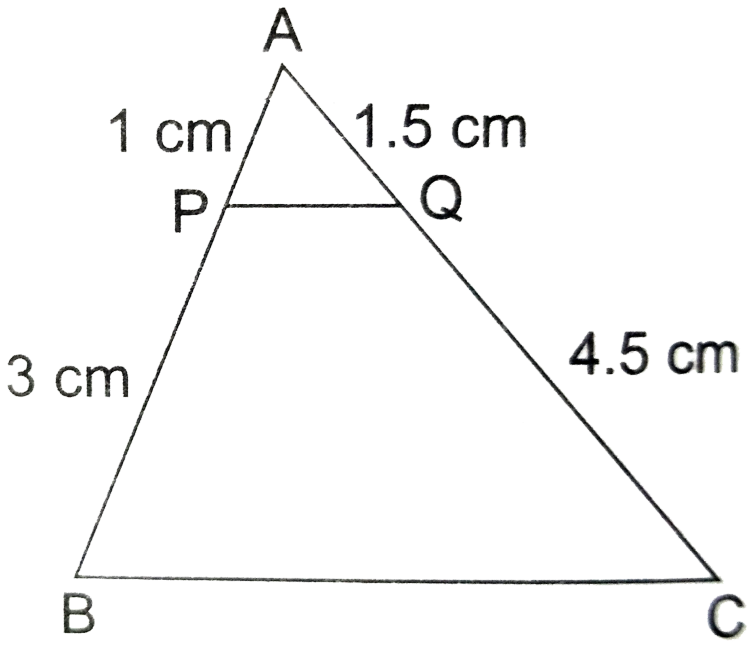
7. The areas of two similar triangles are $81cm^2$ and $49cm^2$ respectively . If the altitude of the triangle is $6.3cm$, find the corresponding altitude of the other.

Watch Video Solution

8. The areas of two similar triangle are $100cm^2$ and $64cm^2$ respectively. If a median of the smaller triangle is 5.6 cm, find th corresponding median of the other.

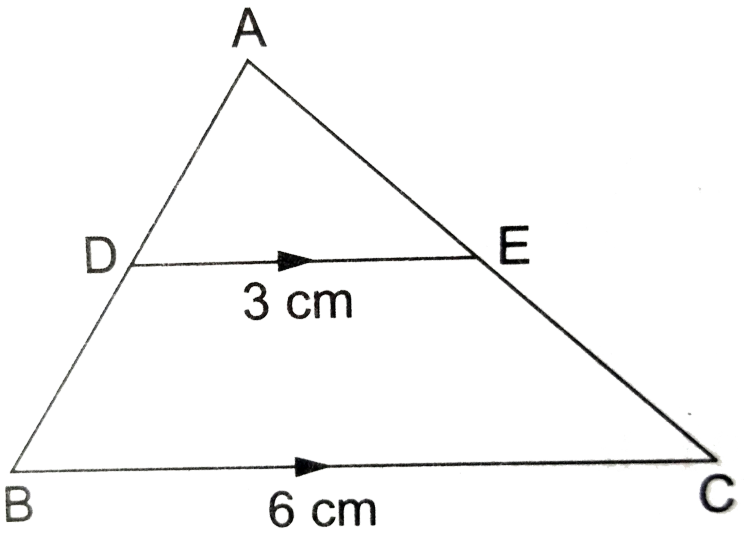
Watch Video Solution

9. In the given figure, ABC is triangle and PQ is a stright line meeting AB in P and AC in Q. if $AP = 1cm, PB = 3cm, AQ = 1.5cm, QC = 4.5cm$ prove that area of ΔAPQ is $\frac{1}{16}$ of the area of ΔABC.



Watch Video Solution

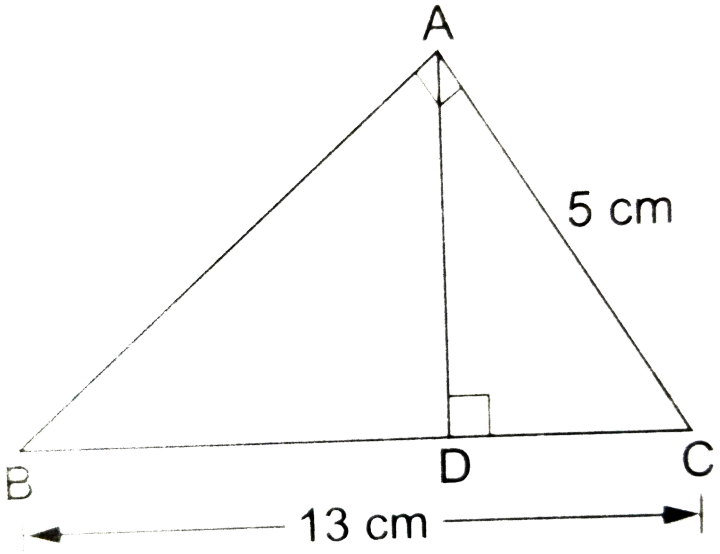
10. In the given figure, $DE \| BC$. If $DE = 3cm$, $BC = 6$ and $ar(\Delta ADE) = 15cm^2$, find the area of ΔABC.



Watch Video Solution

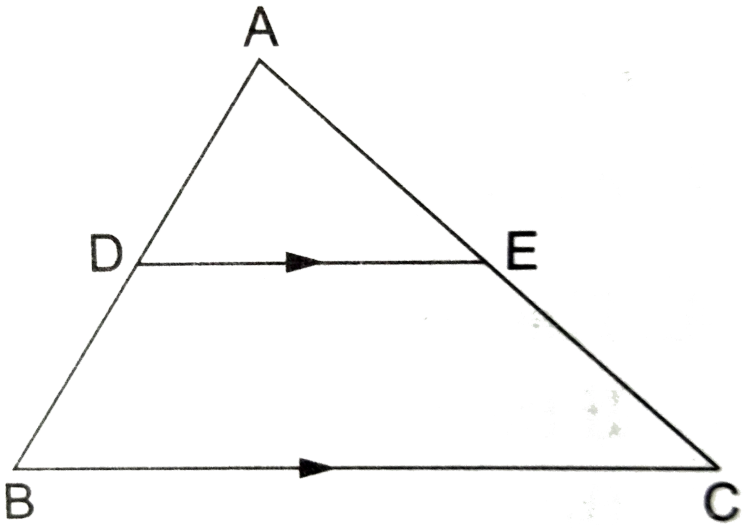
11. ΔABC is right-angled at A and $AD \perp BC$. If $BC = 13cm$ and $AC = 5cm$, find the ratio of areas of

ΔABC and ΔADC.



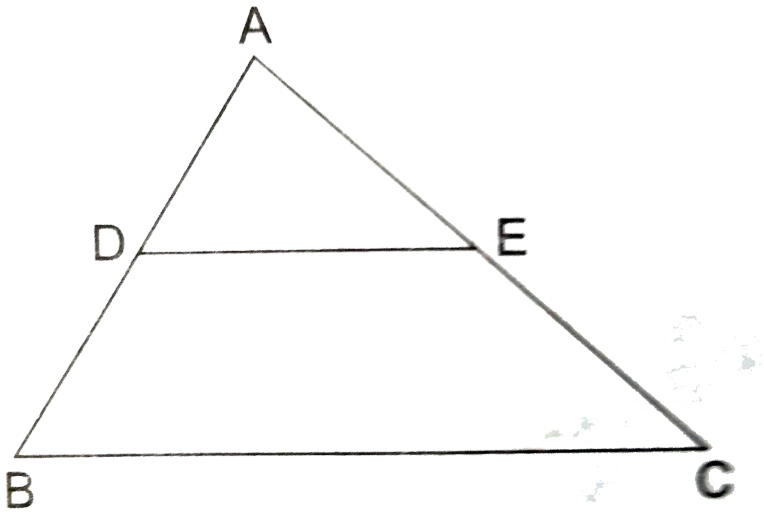
Watch Video Solution

12. In the given figure, $DE \| BC$ and $DE : BC = 3 : 5$. Calculate the ratio of areas of ΔADE and the trpezium BCED.



Watch Video Solution

13. In ΔABC, D and E are the midpoint of AB and AC respectively. Find the ratio of the areas of ΔADE and ΔABC.



Watch Video Solution

Exercise 7 D

1. Find in each cash whether the sides of the triangle, as given below form a right triangle or not

(1) 9 cm, 12 cm and 15 cm (ii) 8 cm,15 cm and 17 cm

(iii) 7 cm, 24 cm and 25 cm

Watch Video Solution

2. A man goes 80 m due east and then 150 m due north. How far is he from the starting point?

Watch Video Solution

3. A man goes 10 m due south and then 24 n due west. How far is from the starting point ?

Watch Video Solution

4. A 13-m long ladder reaches a window of building 12 m above the ground. Determine the distance of the foot the ladder from the building.

Watch Video Solution

5. A ladder is placd in such a way that its foot is a distance of 15 m from a wall and its top reaches a window 20m abvoe the ground. Find the leng of the ladder .

Watch Video Solution

6. Two poles of height 9m and 14m stand on a plane ground. If the distance between their feet is 12m, find the distance between their tops.

A. $11m$

B. $12m$

C. $13m$

D. $14m$

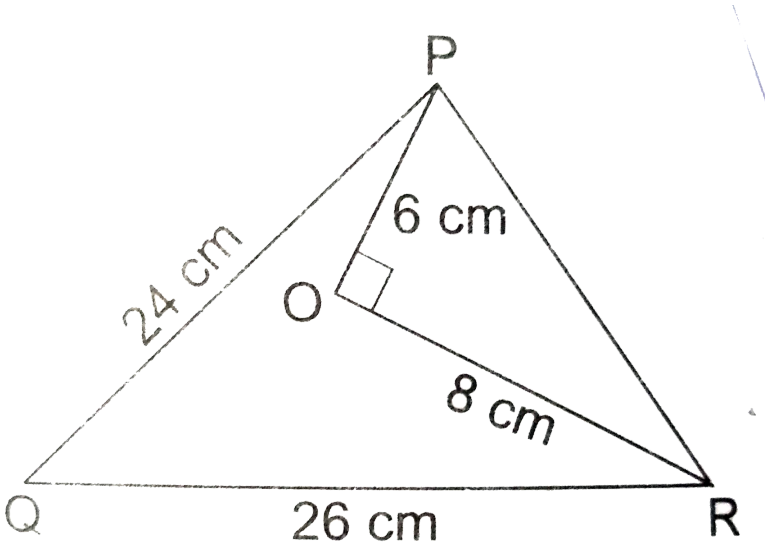
Answer: C

Watch Video Solution

7. A guy wire attached to a vertical pole of height 18m is 24m long and has a stake attached to the other end. How far from the base of the pole should the stake be driven so that the wire will be taut?

Watch Video Solution

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



Watch Video Solution

9. In an isosceles triangle ABC, if $AB = AC = 13$ cm and the altitude from A on BC is 5 cm, find BC.

Watch Video Solution

10. Find the length of altitude AD of an isosceles ΔABC in which $AB = AC = 2a$ units and BC=a units.

Watch Video Solution

11. ΔABC is an equilateral triangle of side 2a units. Find each of its altitudes.

Watch Video Solution

12. Find the height of an equilateral triangle of side 12 cm

Watch Video Solution

13. Find the length of a diagonal of reactangle whose adjacent sides are 30 and 16 cm

Watch Video Solution

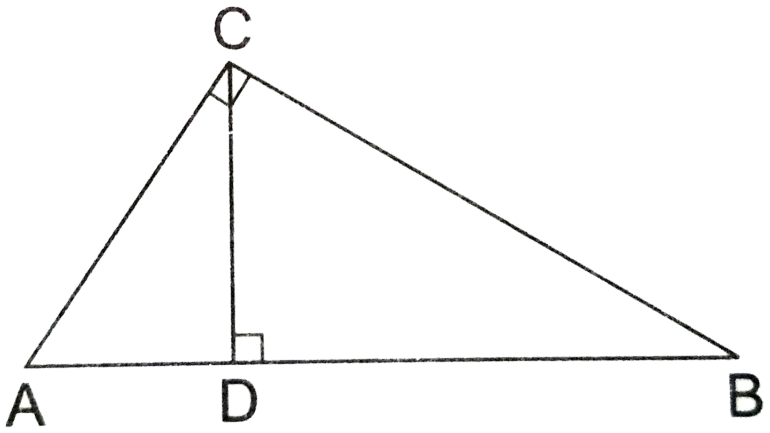
14. Find the length of each side of a rhombus whose diagonals are 24 cm and 10 m long.

Watch Video Solution

15. In $\Delta ABC, D$ is the midpoint of BC and $AE \perp BC$. If $AC > AB$, show that $AB^2 = AD^2 - BC \cdot DE + \frac{1}{4}BC^2$

Watch Video Solution

16. In the given figure $\angle ABC = 90^\circ$ and $CD \perp AB$. Prove that $\frac{BC^2}{AC^2} = \frac{BD}{AD}$



Watch Video Solution

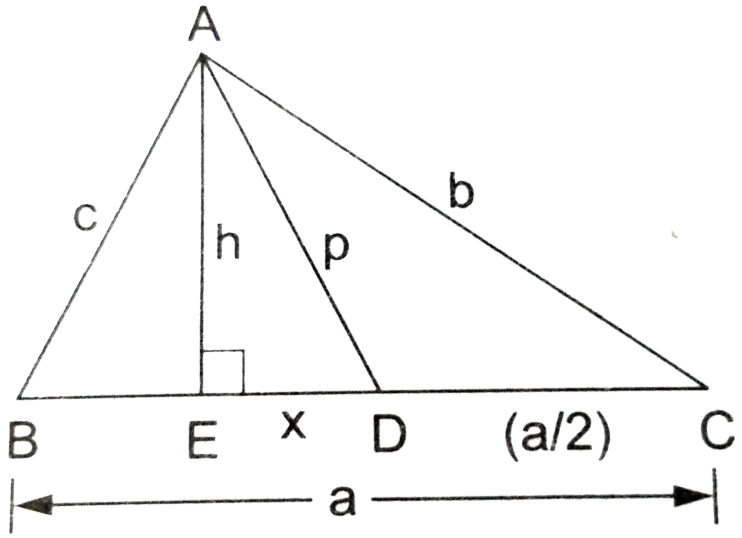
17. In the given figure, D is the midpoint of side BC and $AE \perp BC$. If $BC = a, AC = b, AB = c, ED = xAD = p$ and $AE = h$ prove that

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

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

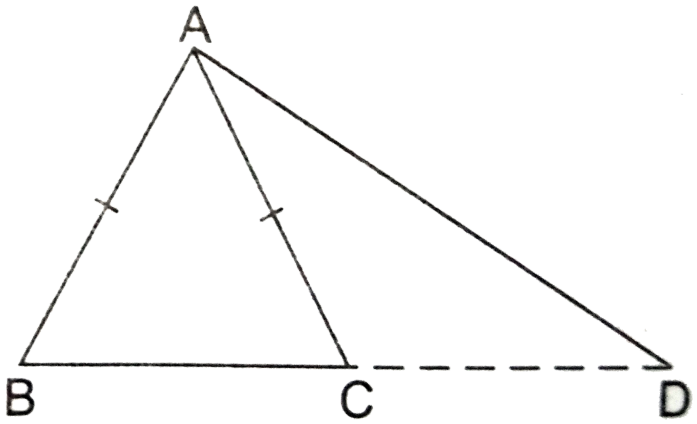
(iii) $\left(b^2 + c^2\right) = 2p^2 + \frac{1}{2}a^2$

$(iv)\left(b^2-c^2\right)=2ax.$



Watch Video Solution

18. In $\Delta ABC, AB=AC.$ Side BC is produced to D. Prove that $\left(AD^2-AC^2\right)=BD\cdot CD.$



Watch Video Solution

19. ABC is an isosceles triangle, right-angled at B. Similar trianles ACD and ABE are constructed on sides AC and AB. Find ratio between the areas of ΔABE and ΔACD.

Watch Video Solution

20. An aeroplane leaves an airport and flies due north at a speed of 1000 km per hour. At the same tune, another aeroplane leaves the same airport

and flies due west at a speed of 1200 km per hour. |How far apart will be the two planes after 1`1/2

Watch Video Solution

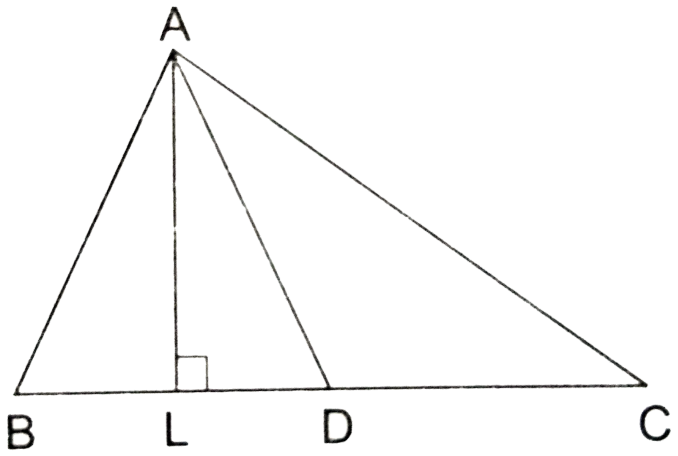
21. In $a\Delta ABC$, AD is a median and $AL \perp BC$.

Prove that

(a) $AC^2 = AD^2 + BC \cdot DL + \left(\frac{BC}{2}\right)^2$

(b) $AB^2 = AD^2 - BC \cdot DL + \left(\frac{BC}{2}\right)^2$

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



Watch Video Solution

22. Nazinia is fly fishing in a stream. The tip of her fishing rod is 1.8 m above the surface of the water and the fly at the end of the string rests on the water 3.6 m away and 2.4 m from a point directly under the tip of the rod. Assuming that h

Watch Video Solution

Exercise 7 E

1. State the two properties which are encessary for given two triangle to be similar.

Watch Video Solution

2. State the basic proportionality theorem.

Watch Video Solution

3. State basic proportionality theorem and its converse.

Watch Video Solution

4. State the midpoint theorem.

Watch Video Solution

5. AAA Similarity Criterion : If two triangles are equiangular; then they are similar

Watch Video Solution

6. State $\forall A$ similarity criterion.

Watch Video Solution

7. State SSS similarity criterion.

Watch Video Solution

8. State SAS similarity criterion.

Watch Video Solution

9. State Pythagoras theorem and its converse.

Watch Video Solution

10. State Pythagoras theorem and its converse.

Watch Video Solution

11. If D,E,F are the mid-points of the sides BC, CA and AB respectively of a triangle ABC, prove by vector method that Area of ΔDEF = 1/4 Area of ΔABC

Watch Video Solution

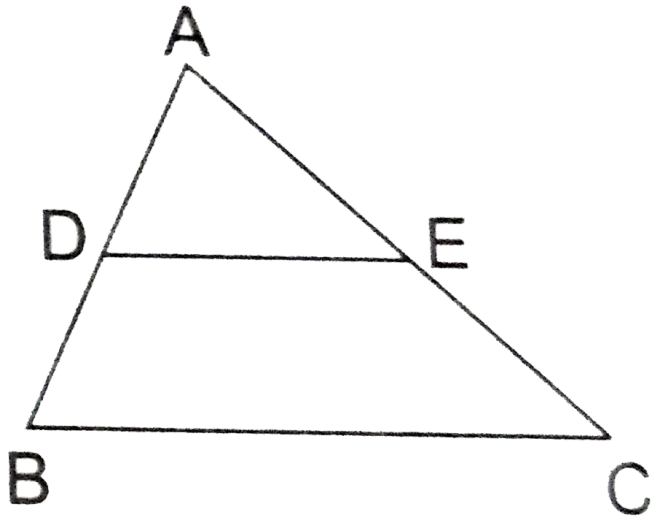
12. Two triangles ABC and PQR are such that $AB = 3cm, AC = 6cm, \angle A = 70^\circ, PR = 9cm, \angle P = 70^\circ$ and $PQ = 4.5$. Show that $\Delta ABC \sim \Delta PQR$ and state the similarity criterion.

Watch Video Solution

13. If $\Delta ABC \sim \Delta DEF$ such that $2AB = DE$ and $BC = 6cm$ find EF.

Watch Video Solution

14. In the given figure, $DE \| BC$ such that $AD = xcm, DB = (3x + 4)cm, AE = (x + 3)cm$ and $EC = (3x + 19)cm$. Find the value of x.



Watch Video Solution

15. A ladder 10 m log reaches the window of a house 8 m above the ground. Find the distance of the foot of the ladder from the base of the wall.

Watch Video Solution

16. Find the length of the altitude of an equilateral triangle of side 2a cm.

Watch Video Solution

17. $\Delta ABC \sim \Delta DEC$ such that $ar(\Delta ABC) = 64cm^2$ and $ar(\Delta DEF) = 169cm^2$. If $BC = 4cm$, find EF.

Watch Video Solution

18. In a trapezium ABCD , it is given that $AB \mid\mid CD$ and $AB = 2CD$. Its diagonals AC and BD intersect at the point O such that $ar(\Delta AOB) = 84cm^2$. Find $ar(\Delta COD)$

Watch Video Solution

19. Corresponding sides of two triangles are in the ratio $2:3$. If the area of the smaller triangle is $48\,cm^2$, determine the area of the larger triangle.

Watch Video Solution

20. In an equilateral triangle with side a, prove that Altitude $= \frac{a\sqrt{3}}{2}$ (ii) Area $= \frac{\sqrt{3}}{4}a^2$

Watch Video Solution

21. Find the length of each side of a rhombus whose diagonals are 24 cm and 10 m long.

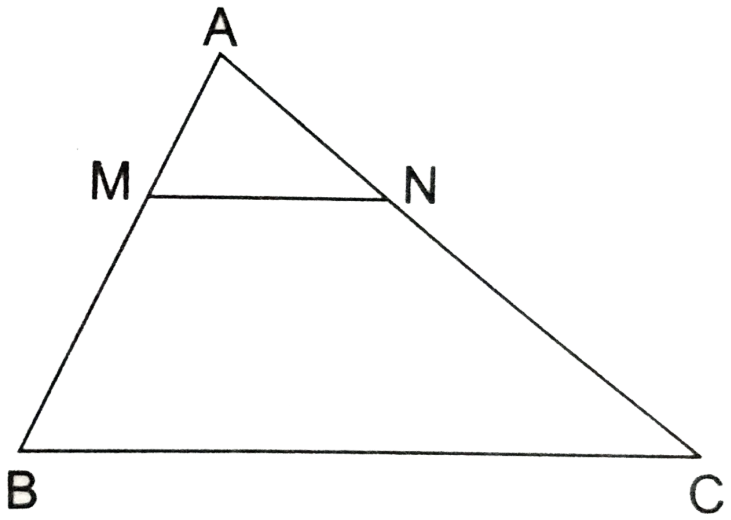
Watch Video Solution

22. Two triangles DEF and GHK are sucht that $\angle D = 48^\circ$ and $\angle H = 57^\circ$. If $\Delta DEF \sim \Delta GHK$ then find the measure of $\angle F$.

Watch Video Solution

23. In the given figure, $MN \mid\mid BC$ and $AM : MB = 1 : 2$

Find $\frac{\text{area}(\Delta AMN)}{\text{area}(\Delta ABC)}$



Watch Video Solution

24. In triangles BMP and CNR it is given that $PB = 5cm, MP = 6cm, BM = 9cm$ and $NR = 9cm.$ If $\Delta BMP \sim \Delta CNR$ then find the perimeter of $\Delta NCR.$

Watch Video Solution

25. Each of the equqal sides of an isosceles triangles is 25 cm. Find the length of its altitude if the base is 14 cm.

Watch Video Solution

26. A man goes 12 m dou south and then 35 m due west. How far is he from the starting point ?

Watch Video Solution

27. If the lengths of the sides BC, CA and AB of ΔABC are a,b, and c repspectively and AD is the bisector of $\angle A$ then find the length of BD and DC.

Watch Video Solution

28. In the given figure, $\angle AMN = \angle MBC = 76^\circ$. If p, q and r are the lengths of AM, MB and BC respectively then express the length of MN in term of a,b and c.

Watch Video Solution

29. The lengths of the diagonals of a rhombus are 40 cm and 42 cm. find the length of each side of the rhombus.

Watch Video Solution

30. (i) Two circles with different radii are similar.

(ii) Any two rectangels are similar.

(iii) If two triangles are similar then their coresponding angles are equal and their corresponding sides are equal.

(iv) The lenghts of the line segment joining the midpoints of any two sides of a triangle is equal to half lenge of the third side.

(v) In a $\triangle ABC$, AB = 6 cm, $\angle A = 45^\circ$ and AC = 8 cm and in a $\triangle DEF$, DF = 9 cm $\angle D = 45^\circ$ and DE = 12 cm then $\triangle ABC \sim \triangle DEF$.t

(vi) The polygon formed by joining the midpoints of the sies of a quadrilaterla is a rhombus.

(vii) The ratio of the areas of two similar triangls is equal to the ratio of thier corresponding angle-bisector segments.

(viii) The ratio of the perimeeters of two similar triangles is the same as the ratio of their corresponding medians.

(ix) If O is any point inside a rectangle ABCD then $OA^2 + OC^2 = OB^2 + OD^2$

(x) The sum of the squares on the sides of a rhombus is equal to the sum of the squares on its diagonals.

Watch Video Solution

Multiple Choice Questions Mcq

1. A man goes 24 m due west and then 10 m due north. How far is he from the starting point ?

A. 34 m

B. 17 m

C. 26 m

D. 28 m

Answer: C

Watch Video Solution

2. Two poles of height 13 m and 7 m respectively stand vetically on a plane ground at a distance of 8 m of from each other. The distance btewen their

tops is

A. 9 m

B. 10 m

C. 11 m

D. 12 m

Answer: B

Watch Video Solution

3. A vertical stick 1.8 m long casts a shadow 45 cm long on the ground. At the same time, what is the length or the shadow of a pole 6 m high?

A. $2.4m$

B. $1.35m$

C. $1.5m$

D. $13.5m$

Answer: C

Watch Video Solution

4. A vertical pole 6 m log casts a shadow of length 3.6 m on the ground. What is the height of tower which casts a shadow of length 18 m at the same time?

A. $10.8m$

B. $28.8m$

C. $32.4m$

D. 30m

Answer: D

Watch Video Solution

5. The shadow of a 5-m-long stick is 2m long. At the same time, the length of the shadow of a $12.5m$-m-high tree is

A. 3.0

B. 3.5

C. 4.5

D. 5.0

Answer: D

Watch Video Solution

6. A ladder 25 m log just reaches the top of a building 24 m high from the ground. What is the distance of the foot of the ladder from the building ?

A. 7 m

B. 17m

C. 21m

D. $24.5m$

Answer: A

Watch Video Solution

7. In the given figure, O is point inside a ΔMNP such that $\angle MOP = 90^\circ$ $OM = 16cm$ and $OP = 12cm$,. If $MN = 21cm$ and $\angle NMP = 90^\circ$ then $NP = ?$

A. 25 cm

B. 29 cm

C. 33 cm

D. 35 cm

Answer: B

Watch Video Solution

8. The hypotenuse of a right triangle is 25 cm. The difference between the lengths of the other two sides of the triangle is 5 cm. Find the lengths of these sides.

A. 10 cm, 15 cm

B. 15 cm, 20 cm

C. 12 cm, 17 cm

D. 13 cm, 18 cm

Answer: B

Watch Video Solution

9. The height of an equilateral triangle having each side 12 cm, is

A. $6\sqrt{2}cm$

B. $6\sqrt{3}cm$

C. $3\sqrt{6}cm$

D. $6\sqrt{6}cm$

Answer: B

Watch Video Solution

10. In an isosceles triangle ABC, if $AB = AC = 13$ cm and the altitude from A on BC is 5 cm, find BC.

A. 12 cm

B. 16 cm

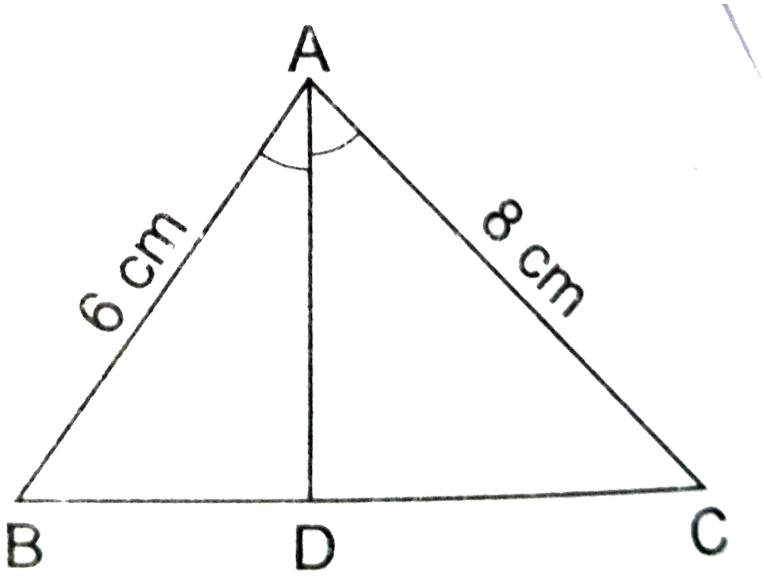
C. 18 cm

D. 24 cm

Answer: D

Watch Video Solution

11. In $a\Delta ABC$ it is given that $AB = 6cm$, $AC = 8cm$ and AD is the bisector of $\angle A$. Then $BD : DC = ?$



A. $3:4$

B. $9:16$

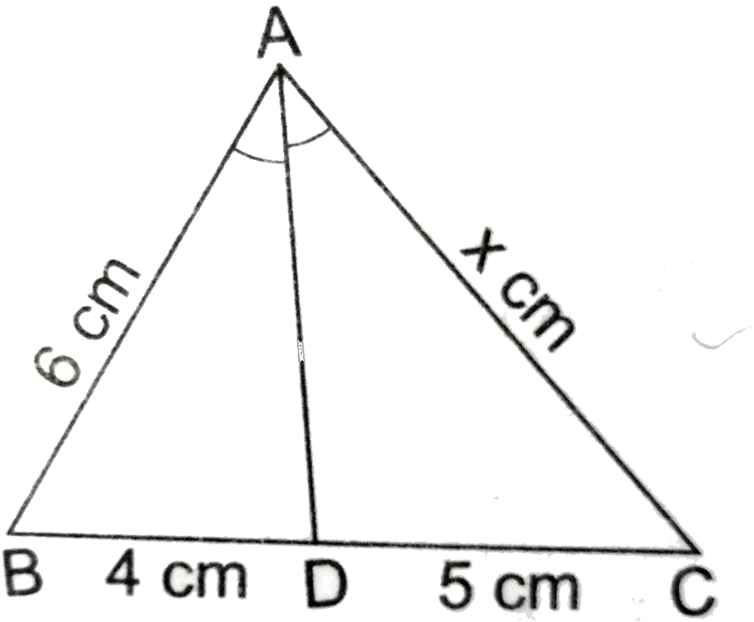
C. $4:3$

D. $\sqrt{3}:2$

Answer: A

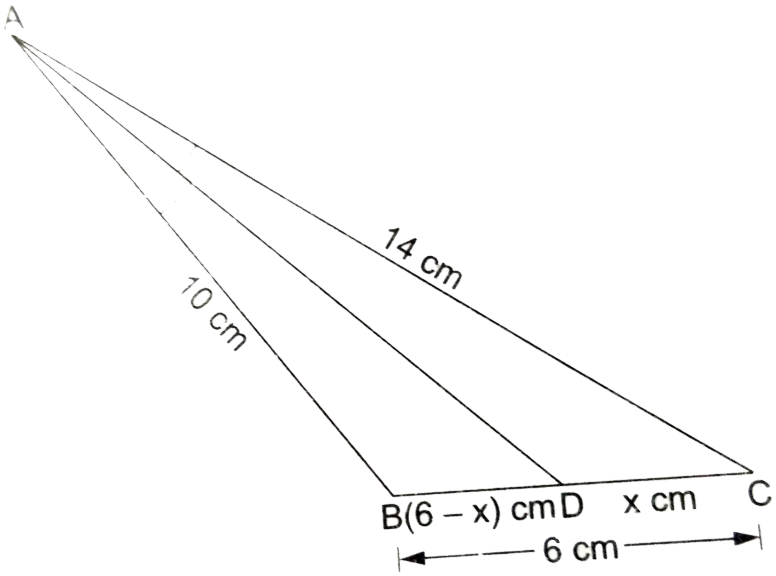
Watch Video Solution

12. In a ΔABC it is given AD is internal bisector of $\angle A$. If $BD = 4cm, DC = 5cm$ and $AB = 6cm$, then AC =?



Watch Video Solution

13. In a $\Delta ABC,$ it is give ttha AD is the internal bisector of $\angle A$. If $AB = 10cm, AC = 14cm$ and $BC = 6cm$ then CD=?



A. $4.8cm$

B. $3.5cm$

C. 7 cm

D. $10.5cm$

Answer: B

Watch Video Solution

14. If the median to the base of a triangle is perpendicular to the base then triangle is isosceles.

A. right-angled

B. isosceles

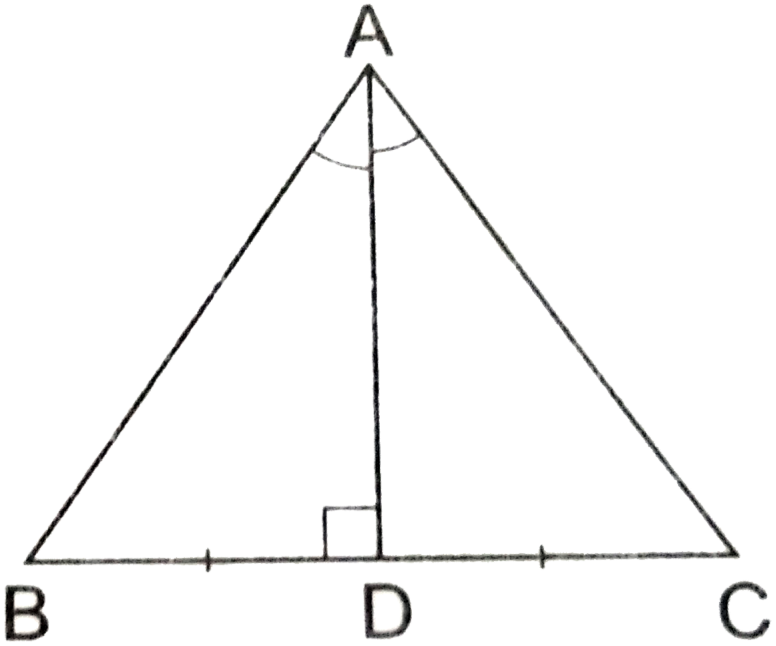
C. scalene

D. obtuse-angled

Answer: B

Watch Video Solution

15. In an equilateral triagnle ABC, if $AD \perp BC$ then which of the following is true?



A. $2AB^2 = 3AD^2$

B. $4AB^2 = 3AD^2$

C. $3AB^2 = 4AD^2$

D. $3AB^2 = 2AD^2$

Answer: C

Watch Video Solution

16. In a rhombus of side 10 cm, one of the diagonals is 12 cm long. The length of the second diagonals is

A. 20 cm

B. 18 cm

C. 16 cm

D. 22 cm

Answer: C

Watch Video Solution

17. The lengths of the diagonals of a rhombus are 24 cm and 10 cm. The length of each side of the rhombus is

A. 12 cm

B. 13 cm

C. 14 cm

D. 17 cm

Answer: B

Watch Video Solution

18. If the diagonals of a quadirlateral divide each other proportionally then it is a

A. parallelogram

B. trapezium

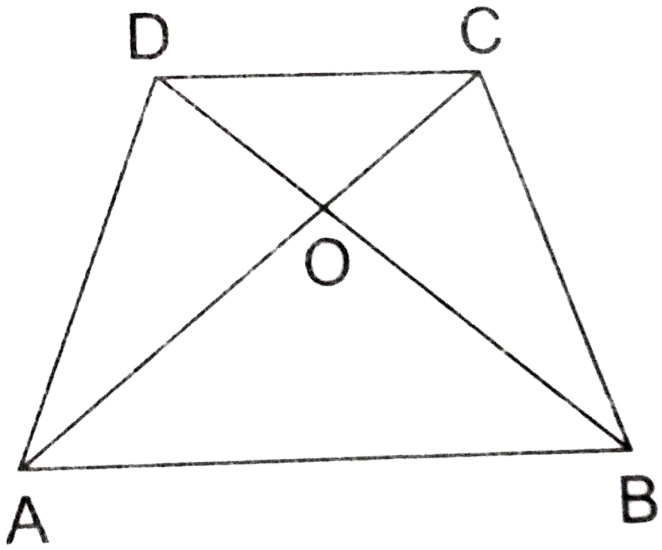
C. rectangle

D. square

Answer: B

Watch Video Solution

19. In the given figure, ABCD is trapezium whow diagonals AC and BD intersect at O such that $OA = (3x - 1)cm, (OB = (2x + 1)cm, OC = (5x - 3)cm$ and $OD = (6$. Then, x=?



Watch Video Solution

20. The line segments joining the midpoints of the adjacent sides of a quadrilateral form

A. a parallelogram

B. a rectangle

C. a square

D. a rhombus

Answer: A

Watch Video Solution

21. If the bisector of an angle of a triangle bisects the opposite side, prove that the triangle is isosceles.

A. acalene

B. equilateral

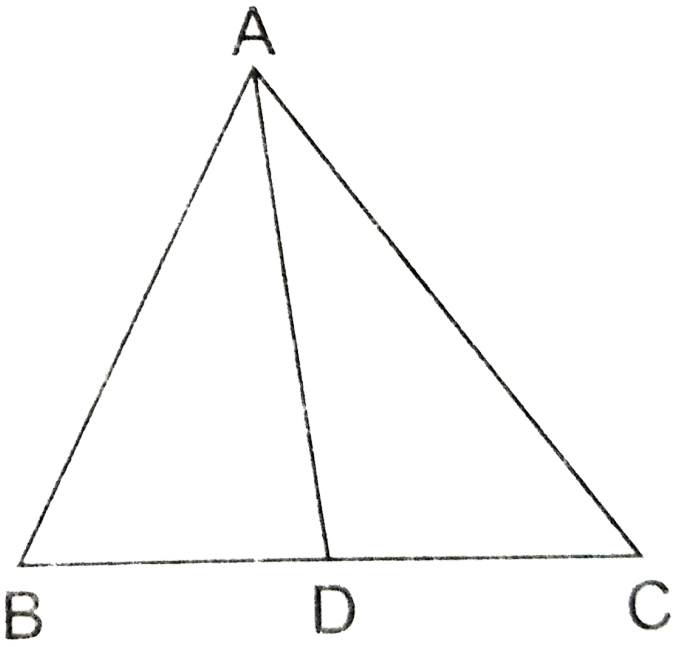
C. isosceles

D. right-angled

Answer: C

Watch Video Solution

22. In ΔABC it is given that $\frac{AB}{AC} = \frac{BD}{DC}$. If $\angle B = 70^\circ$ and $\angle C = 50^\circ$ then $\angle BAD = ?$



A. 30°

B. 40°

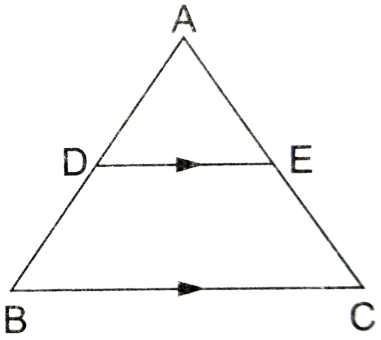
C. 45°

D. 50°

Answer: A

Watch Video Solution

23. In $\Delta ABC, DE \| BC$ so that $AD = = 2.4cm, AE = 3.2cm$ and $EC = 4.8cm$, then , AB= ?



A. 3.6 cm

B. 6 cm

C. 6.4 cm

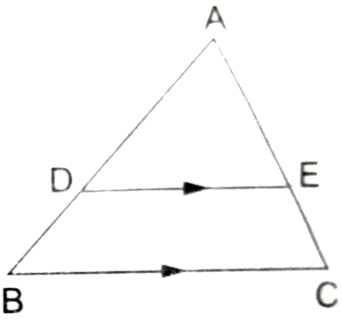
D. 7.2 cm

Answer: B

Watch Video Solution

Watch Video Solution

24. In a ΔABC, if DE is drawn parallel to BC, cutting AB and AC to D and E respectively such that $AB = 7.2cm$, $AC = 6.4cm$ and $AD = 4.5cm$. Then, AE=?



A. $5.4cm$

B. 4 cm

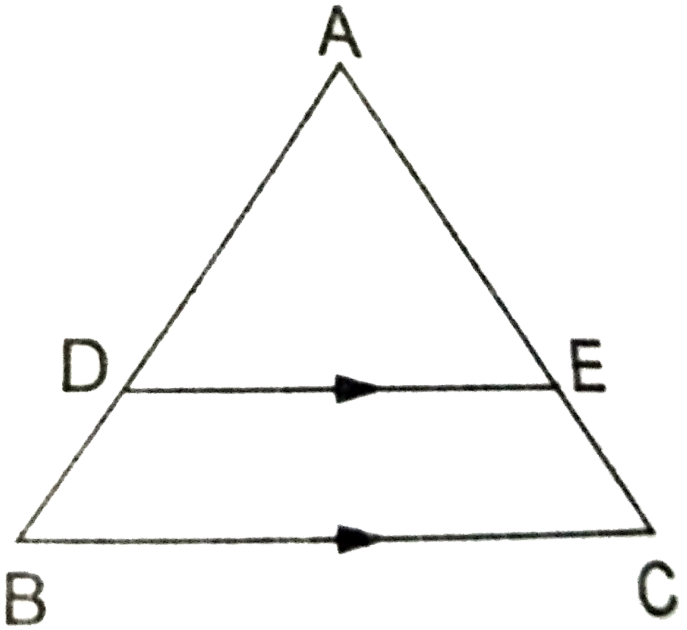
C. $3.6cm$

D. $3.2cm$

Answer: B

Watch Video Solution

25. In $\Delta ABC, DE \mid \mid BC$ so that $AD = (7x - 4)cm, AE = (5x - 2)cm, DB = (3x + 4)cm$ and $EC = 3x$. Then, we have



A. x=3

B. x=5

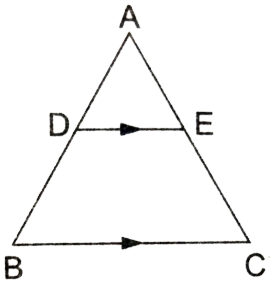
C. x=4

D. $x = 2.5$

Answer: C

Watch Video Solution

26. In $\Delta ABC, DE \| BC$ such that $\frac{AD}{DB} = \frac{3}{5}$. If $AC = 5.6cm$ then, AE=?



A. $4.2cm$

B. $3.1cm$

C. $2.8cm$

D. $2.1cm$

Answer: D

Watch Video Solution

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

A. $6.3cm$

B. $5.4cm$

C. $7.2cm$

D. $4.5cm$

Answer: B

Watch Video Solution

28. The corresponding sides of two similar triangles ABC and DEF are $BC = 9.1cm,$ and $EF = 6.5cm.$ If the perimete of ΔDEF is 25 cm, find the perimeter of $\Delta ABC.$

A. 35 cm

B. 28 cm

C. 42 cm

D. 40 cm

Answer: A

Watch Video Solution

29. In ΔABC, it is given that $AB = 9cm, BC = 6cm,$ and $CA = 7.5cm$. AlsoΔDEF is givne such that $EF = 8cm$ and ΔDEF~ΔABC. Then perimeter of ΔDEF is

A. $22.5cm$

B. $25cm$

C. 27 cm

D. 30 cm

Answer: D

Watch Video Solution

30. ABC and BDE are two equilateral triangles such that D is the mid-point of BC . The ratio of the areas of the triangles ABC and BDE is $2:1$ (b) $1:2$ (c) $4:1$ (d) $1:4$

A. $1:2$

B. $2:1$

C. $1:4$

D. $4:1$

Answer: D

Watch Video Solution

31. If $\Delta ABC \sim \Delta DFE$, $\angle A = 30$, $\angle C = 50^\circ$,AB=5 cm,AC=8 cm and DF=7.5 cm. Then, which of the following is true?

A. $DE = 12cm, \angle F = 50^\circ$

B. $DE = 12cm, \angle F = 100^\circ$

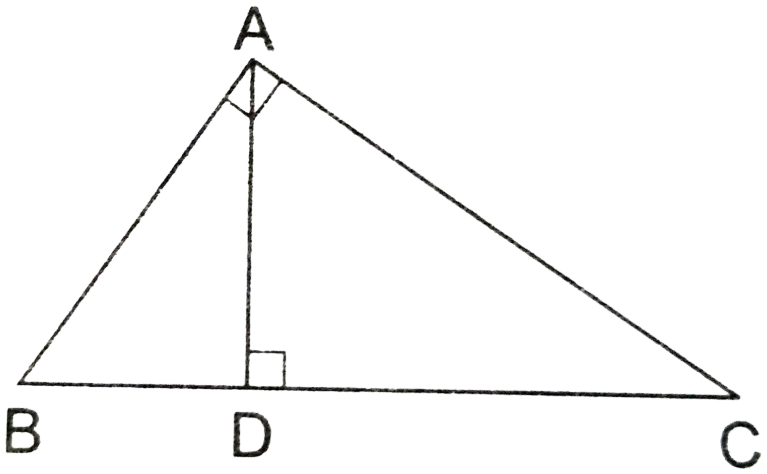
C. $EF = 12cm, \angle D = 100^\circ$

D. $EF = 12cm, \angle D = 30^\circ$

Answer: B

Watch Video Solution

32. In the given figure, $\angle BAC = 90^\circ$ and $AD \perp BC$.then,



A. $BC \cdot CD = BC^2$

B. $AB \cdot AC = BC^2$

C. $BD \cdot CD = AD^2$

D. $AB \cdot AC = AD^2$

Answer: C

Watch Video Solution

33. In ΔABC, $AB = 6\sqrt{3}cm$, $AC = 12cm$ and $BC = 6cm$. Then $\angle B$ is

A. 45°

B. 60°

C. 90°

D. 120°

Answer: C

Watch Video Solution

34. In ΔABC and ΔDEF, it is given that $\frac{AB}{DE} = \frac{BC}{FD}$ then they will be similar when

A. $\angle B = \angle E$

B. $\angle B = \angle D$

C. $\angle B = \angle D$

D. Right-angled

Answer: C

Watch Video Solution

35. In ΔDEF and ΔPQR, it is given that $\angle D = \angle Q$ and $\angle R = \angle E$, then which of the following is not true?

A. $\frac{EF}{PR} = \frac{DF}{PQ}$

B. $\frac{DE}{PQ} = \frac{EF}{RP}$

C. $\frac{DE}{QR} = \frac{DF}{PQ}$

D. $\frac{EF}{RP} = \frac{DE}{QR}$

Answer: B

Watch Video Solution

36. If $\Delta ABC \sim \Delta EDF$ and ΔABC is not similar to ΔDEF then which of the following is not ture ?

A. $BC \cdot EF = AC \cdot FD$

B. $AB \cdot EF = AC \cdot DE$

C. $BC \cdot DE = AB \cdot EF$

D. $BC \cdot DE = AB \cdot FD$

Answer: C

Watch Video Solution

37. In ΔABC and ΔDEF, it is given that $\angle B = \angle E \angle F = \angle C$ and $AB = -3DE$, then the two triangles are

A. congruent but not similar

B. similar but not congruent

C. neither congruent nor similar

D. similar as well as congruent

Answer: B

Watch Video Solution

38. If in two ΔABC and ΔPQR, $\frac{AB}{QR} = \frac{BC}{PR} = \frac{CA}{PQ}$, then

A. $\Delta PQR \sim \Delta CAB$

B. $\Delta PQR \sim \Delta ABC$

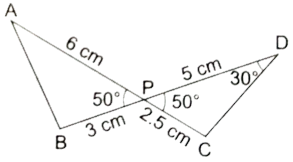
C. $\Delta CAB \sim \Delta PQR$

D. $\Delta BCA \sim \Delta PQR$

Answer: A

Watch Video Solution

39. In the given figure, two line segments AC and BD inersect each other at the point P such that $PA = 6cm, PB = 3cm, PC = 2.5cm, PD = 5cm \angle APB = 50^\circ$ and $\angle CI$ then $\angle PBA = ?$



A. 50°

B. 30°

C. 60°

D. 100°

Answer: D

Watch Video Solution

40. Sides of two similar triangles are in the ratio $4:9$ Areas of these triangles are in the ratio.

A. $2:3$

B. $4:9$

C. $9:4$

D. $16:81$

Answer: D

Watch Video Solution

41. It is given that $\Delta ABC \sim \Delta PRQ$ and $\frac{BC}{QR} = \frac{2}{3}$ then $\frac{ar(\Delta PQR)}{ar(\Delta ABC)} = ?$

A. $\frac{2}{3}$

B. $\frac{3}{2}$

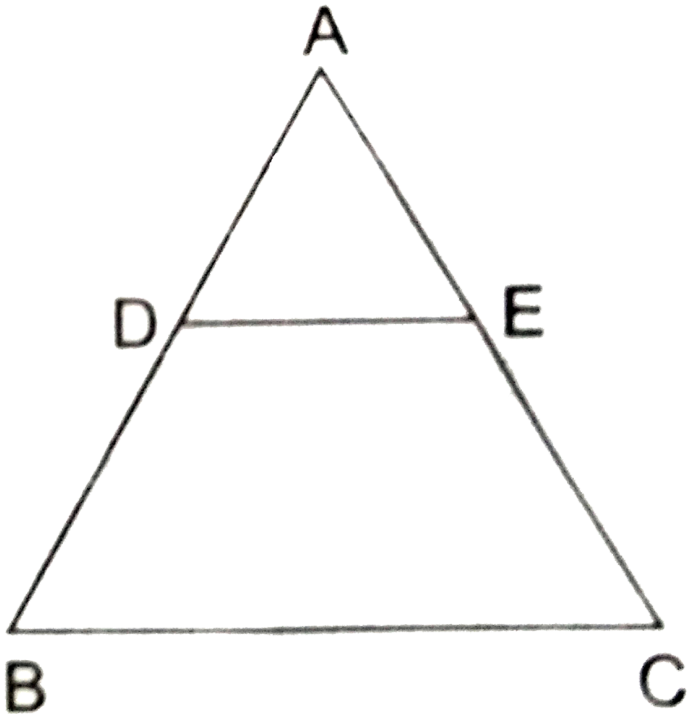
C. $\frac{4}{9}$

D. $\frac{9}{4}$

Answer: D

Watch Video Solution

42. In an equilateral $\Delta ABC, D$ is the midpoint of AB and E is the midpoint of AC. Then, $ar(\Delta ABC) : ar(\Delta ADE) = ?$



A. $2:1$

B. $4:1$

C. $1:2$

D. $1:4$

Answer: B

Watch Video Solution

43. In ΔABC and ΔDEF, we have $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF} = \frac{5}{7}$, then $ar(\Delta ABC) : ar(\Delta DFR) = ?$

A. $5:7$

B. $25:49$

C. $49:25$

D. $125:343$

Answer: B

Watch Video Solution

44. $\Delta ABC \sim \Delta DEF$ such that $ar(\Delta ABC) = 36cm^2$ and $ar(\Delta DEF)49cm^2$. Then, the ratio of their corresponding sides is

A. $36:49$

B. $6:7$

C. $7:6$

D. $\sqrt{6}:\sqrt{7}$

Answer: B

Watch Video Solution

45. Two isosceles triangles have their corresponding angles equal and their areas are in the ratio $25:36$. The ratio of their corresponding heights is

A. $25:36$

B. $36:25$

C. $5:6$

D. $6:5$

Answer: C

Watch Video Solution

46. Prove that the line segments joining the mid-points of the sides of a triangle from four triangles, each of which is similar to the original triangle.

A. congruent to the original triangle

B. similar to the original triangle

C. an isosceles triangle

D. an equilateral triangle

Answer: B

Watch Video Solution

47. If $\Delta ABC \sim \Delta QRP, \frac{ar(\Delta ABC)}{ar(\Delta PQR)} = \frac{9}{4}, AB = 18cm, \text{ and } BC = 15cm,$ then $PR = ?$

A. 8 cm

B. 10 cm

C. 12 cm

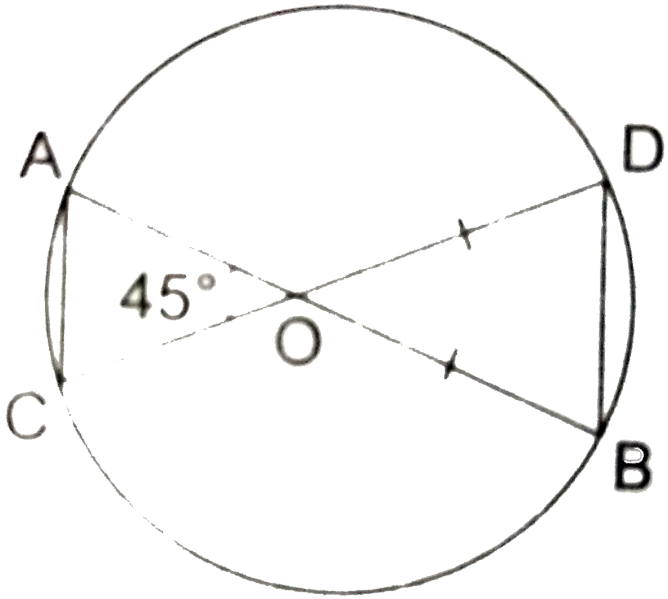
D. $\frac{20}{3}cm$

Answer: B

Watch Video Solution

48. In the given figure, O is the point of intersection of two chords AB and CD such that $OB = OD$ and $\angle AOC = 45^\circ$. Then ,ΔOAC and ΔODB

are



A. equilateral and similar

B. equilateral but not similar

C. isosceles and similar

D. isosceles but not similar

Answer: C

Watch Video Solution

49. In an isosceles ΔABC, if $AC = BC$ and $AB^2 = 2AC^2$ then $\angle C = ?$

A. 30°

B. 45°

C. 60°

D. 90°

Answer: D

Watch Video Solution

50. In ΔABC, if $AB = 16cm, BC = 12cm$ and $AC = 20cm,$ then ΔABC is

A. acute-angled

B. right-angled

C. obtuse-angled

D. not possible

Answer: B

Watch Video Solution

51. Which of the following is a true statement?

A. Two similar triangle are always congruent.

B. Two figures are similar if they have the same shape and size.

C. Two triangles are similar if their corresponding sides are proportional.

D. Two polygons are similar if their corresponding side are proportional.

Answer: C

Watch Video Solution

52. Which of the following is a false statement ?

A. If the areas of two areas of two similar triangles are equal then the triangles are congruent.

B. The ratio of the area of two similar triangles is equal to the ratio of their corresponding sides.

C. The ratio of the area of two similar triangles is equal to the ratio of squares of their corresponding medians.

D. The ratio of the areas of two similar triangles is equal to the ratio of squares of their corresponding altitudes

Answer: B

Watch Video Solution

53. Match the following columns :

Column I	Column II
(a) A man goes 10 m due east and then 20 m due north. His distance from the starting point is ..... m.	(p) $25\sqrt{3}$
(b) In an equilateral triangle with each side 10 cm, the altitude is ..... cm.	(q) $5\sqrt{3}$
(c) The area of an equilateral triangle having each side 10 cm is ..... cm^2.	(r) $10\sqrt{5}$
(d) The length of diagonal of a rectangle having length 8 m and breadth 6 m is ..... m.	(s) 10

The correct answer is

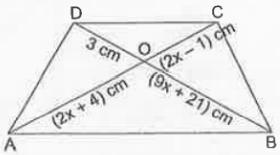
(a) ..... (b) .....

(c)..... (d) .....

Watch Video Solution

Multpile Choice Questions Mcq Matching Of Columns

1. Match of the following columns :

Column I	Column II
(a) In a given $\triangle ABC, DE \parallel BC$ and $\frac{AD}{DB} = \frac{3}{5}$. If $AC = 5.6$ cm then $AE =$ ..... cm.	(p) 6
(b) If $\triangle ABC \sim \triangle DEF$ such that $2AB = 3DE$ and $BC = 6$ cm then $EF =$ ..... cm.	(q) 4
(c) If $\triangle ABC \sim \triangle PQR$ such that $ar(\triangle ABC) : ar(\triangle PQR) = 9 : 16$ and $BC = 4.5$ cm then $QR =$ ..... cm.	(r) 3
(d) In the given figure, $AB \parallel CD$ and $OA = (2x + 4)$ cm, $OB = (9x - 21)$ cm, $OC = (2x - 1)$ cm and $OD = 3$ cm. Then $x = ?$ 	(s) 2.1

The correct answer is

(a) —....., (b) —....., (c) —....., (d) —.....

The correct answer is

(a) ..... (b) ..... (c)..... (d) .....

Watch Video Solution

Test Yourself

1. $\Delta ABC \sim \Delta DEF$ and their perimeters are 32 cm and 24 cm respectively.

If AB=10 cm then DE=?

A. 8 cm

B. 7.5 cm

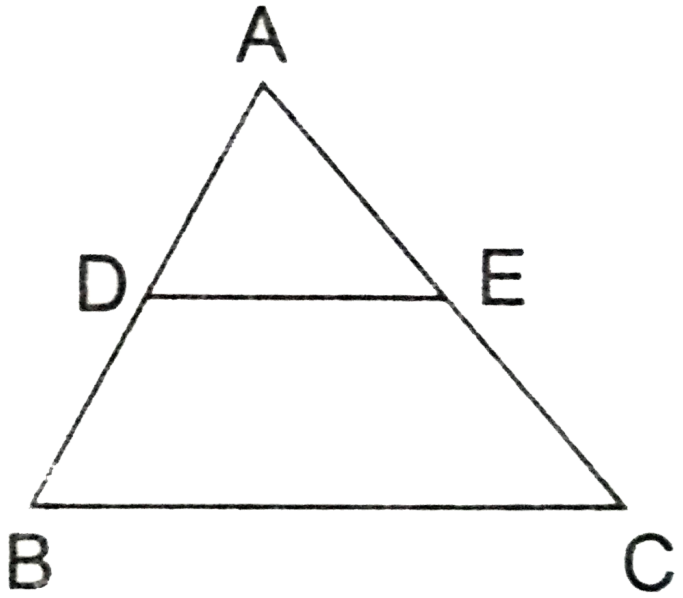
C. 15 cm

D. $5\sqrt{3}$ cm

Answer: B

Watch Video Solution

2. In the given figure, $DE \| BC$. If $DE = 5cm, BC = 8cm$ and $AD = 3.5cm$ then AB=?



A. $5.6cm$

B. $4.8cm$

C. $5.2cm$

D. $6.4cm$

Answer: A

Watch Video Solution

3. Two poles of height 6 meters and 11 meteras stand vertically on a plane ground. If the distance between their feet is 12 meters. Find the distance between their tops.

A. 12 m

B. 13 m

C. 14 m

D. 15 m

Answer: B

Watch Video Solution

4. The areas of two similar triangles are $25cm^2$ and $36cm^2$ respectively. If the altitude of the first triangle is 3.5 cm then the corresponding altitude of the other triangle is

A. $5.6cm$

B. $6.3cm$

C. $4.2cm$

D. $7cm$

Answer: C

Watch Video Solution

5. If $\Delta ABC \sim \Delta DEF$ such that $2AB = DE$ and $BC = 6cm$ find EF.

A. 6 cm

B. 12 cm

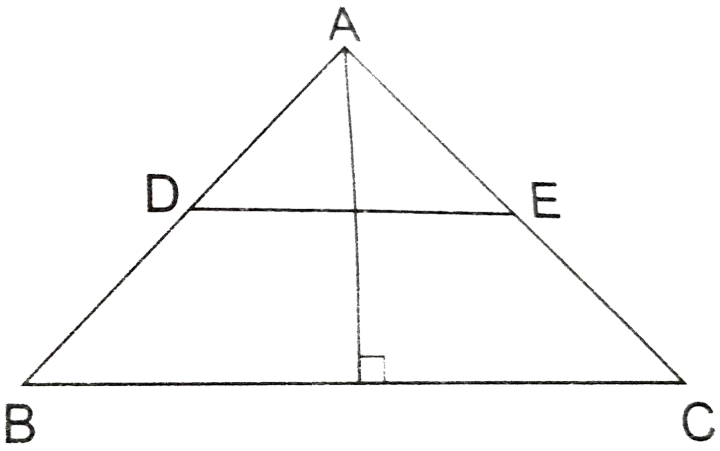
C. 10 cm

D. 8 cm

Answer: B

Watch Video Solution

6. In the given figure, $DE \| BC$ such that $AD = xcm, DB = (3x + 4)cmAE = (x + 3)cm,$ and $EC = (3x + 19)cm$. Find the value of x.



Watch Video Solution

7. A ladder 10m long reaches a window 8 m above the ground. Find the distance of the foot of the ladder from base of the wall.

Watch Video Solution

8. Find the length of the altitude of an equilateral triangle of side $2a$ cm.

Watch Video Solution

9. $\Delta ABC \sim \Delta DEC$ such that $ar(\Delta ABC) = 64cm^2$ and $ar(\Delta DEF) = 169cm^2$. If $BC = 4cm$, find EF.

A. $9.5cm$

B. $6cm$

C. $6.5cm$

D. $4.5cm$

Answer: C

Watch Video Solution

10. In a trapezium ABCD , it is given that $AB \mid\mid CD$ and $AB = 2CD$. Its diagonals AC and BD intersect at the point O such that $ar(\Delta AOB) = 84cm^2$. Find $ar(\Delta COD)$

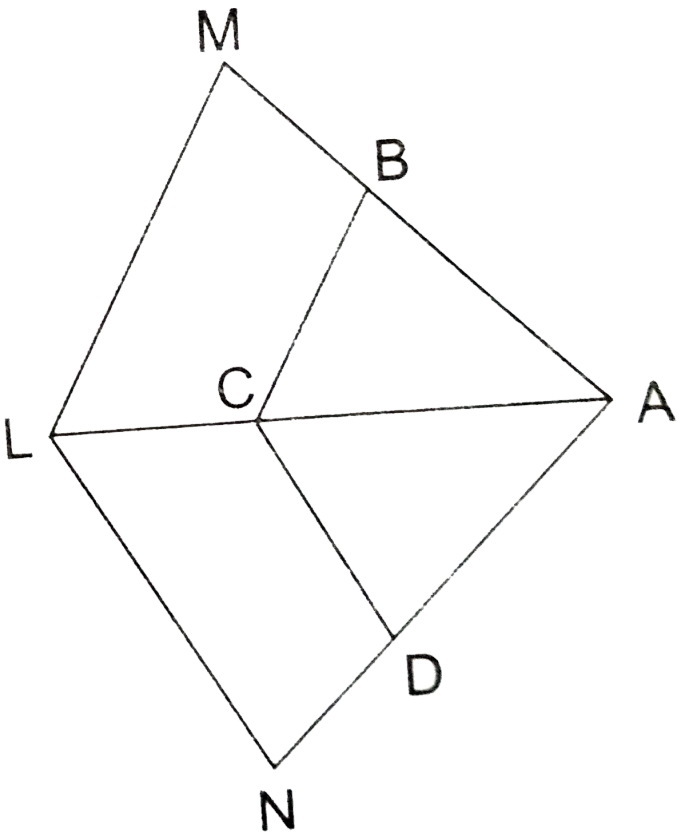
Watch Video Solution

11. The corresonding sides of two similar triangle are in the ratio $2:3$. If the area of the smaller trianle is $48cm^2$, find the area of the larger triangle.

Watch Video Solution

12. In the given figure, $LM||CB||$ and $LN \mid\mid CD$.

Prove that $\frac{AM}{AB} = \frac{AN}{AD}$



Watch Video Solution

13. Prove: The internal angle bisector of an angle of a triangle divide the opposite side internally in the ratio of the sides containing the angle

Watch Video Solution

14. In an equilateral triangle with side a, prove that area $= \frac{\sqrt{3}}{4}a^2$

Watch Video Solution

15. Find the length of each side of a rhombus whose diagonals are 24 cm and 10 m long.

A. 11 cm

B. 15 cm

C. 12 cm

D. 13 cm

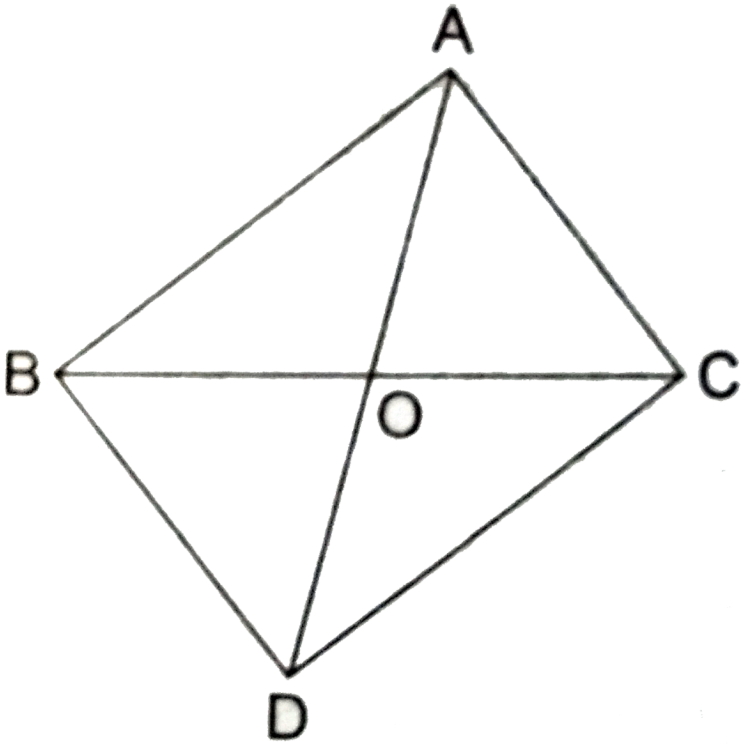
Answer: D

Watch Video Solution

16. Prove that the ratio of the perimeters of two similar triangles is the same as the ratio of their corresponding sides.

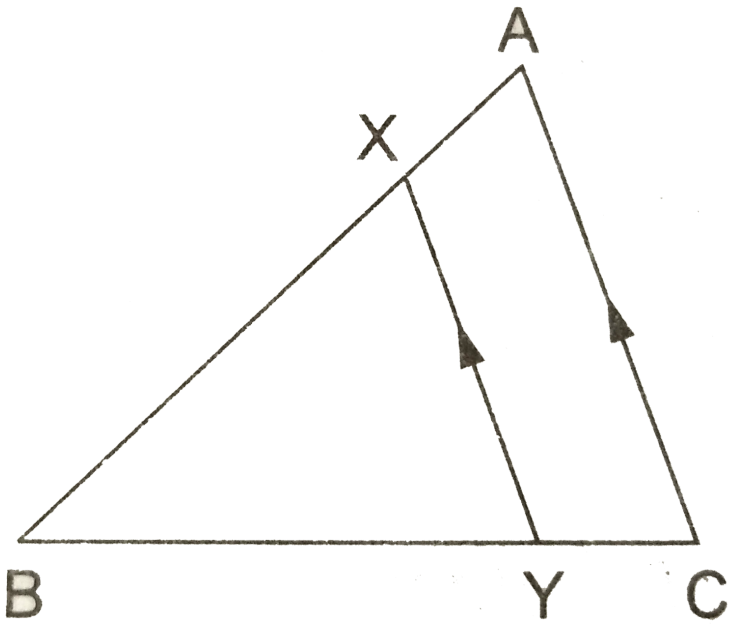
Watch Video Solution

17. In the given figure, ΔABC and ΔDBC have the same base BC. If AD and BC intersect at O, prove that $\frac{ar(\Delta ABC)}{ar(\Delta DBC)} = \frac{AO}{DO}$



Watch Video Solution

18. In the given figure, $XY \mid\mid AC$ and XY divides ΔABC into two regions, equal in area. Find the value of $\frac{AX}{AB}$



A. $\sqrt{2}$

B. $\frac{\left(2-\sqrt{2}\right)}{2}$

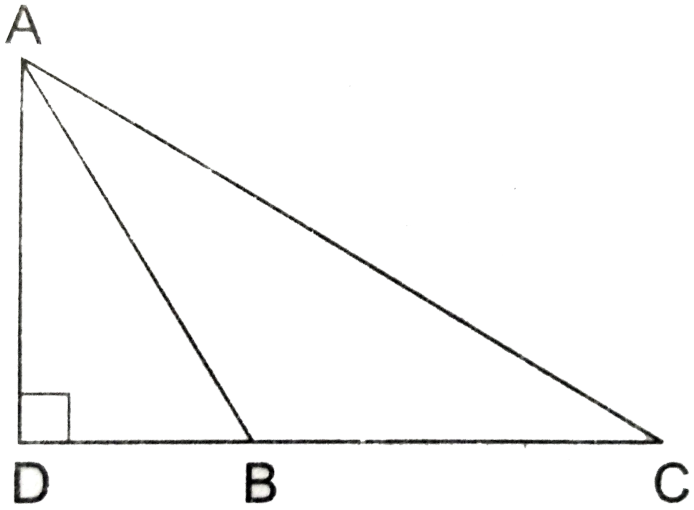
C. $\frac{\left(2+\sqrt{2}\right)}{2}$

D. none of these

Answer: B

Watch Video Solution

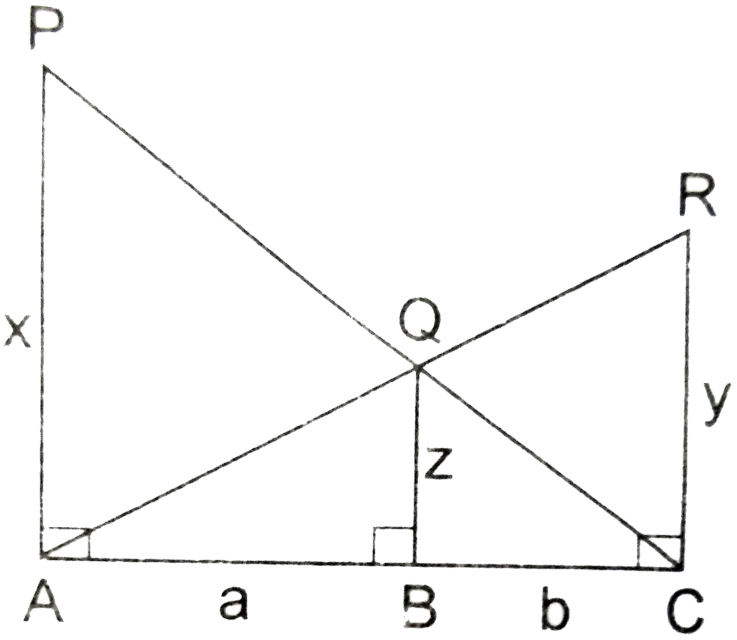
19. In the given figure, ΔABC is an obtuse triangle, obtuse-angled at B. If $AD \perp CB$ (produced) prot that $AC^2 = AB^2 + BC^2 + 2BC \cdot BD$



Watch Video Solution

20. In the given figure, each of PA, QB and RC is perpendicular to Ac. If $AP = x, QB = z, RC = y, AB = a$ and $BC = b$, show that

$$\frac{1}{x}+\frac{1}{y}=\frac{1}{z}$$



Watch Video Solution