



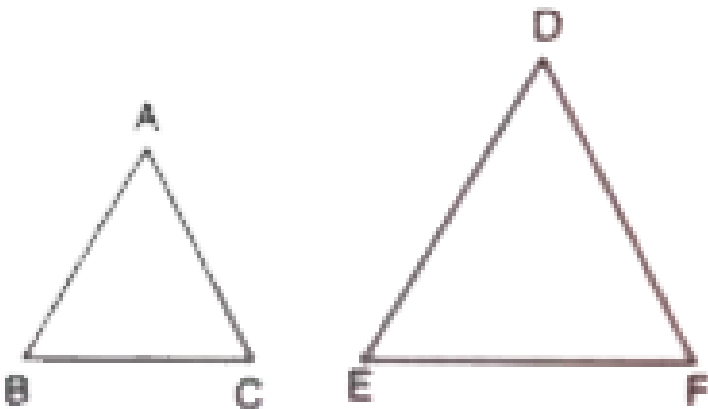
MATHS

BOOKS - SELINA MATHS (ENGLISH)

SIMILARITY

Questions

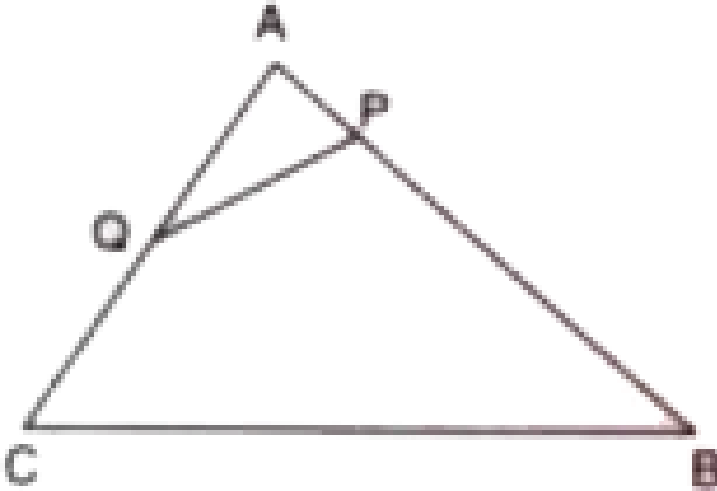
1. In the given figure, $\triangle ABC$ is similar to $\triangle DEF$, $AB = (x - 0.5)$ cm, $AC = 1.5x$ cm, $DE = 9$ cm, and $DF = 3x$ cm. Find the lengths of AB and DF .





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2. In the given figure, $AP = 8$ cm, $BP = 22$ cm, $AQ = 12$ cm and $QC = 8$ cm

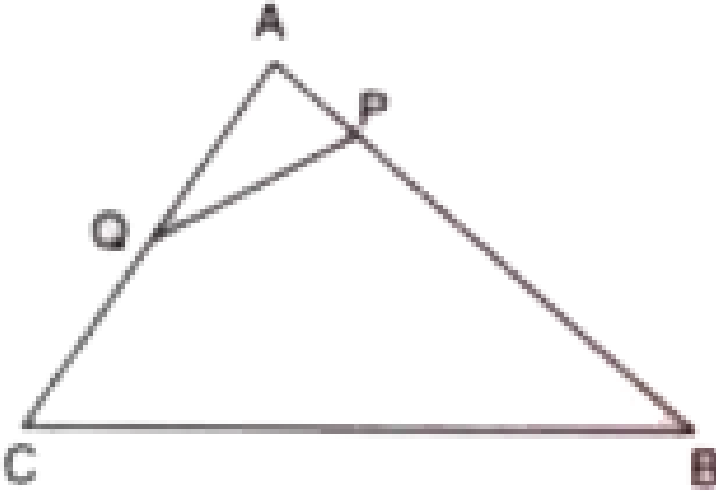


Show that $\triangle APQ$ is similar to $\triangle ACB$.



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3. In the given figure, $AP = 8$ cm, $BP = 22$ cm, $AQ = 12$ cm and $QC = 8$ cm



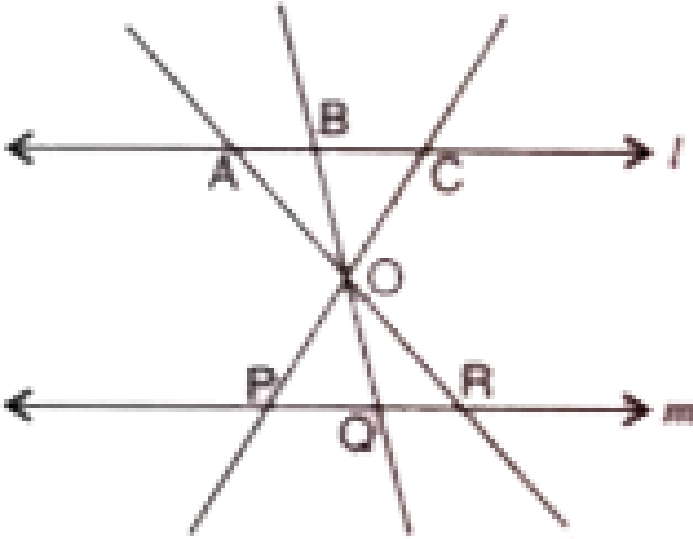
If $PQ = 14$ cm, find BC .

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4. Theorem 6.7 : If a perpendicular is drawn from the vertex of the right angle of a right triangle to the hypotenuse then triangles on both sides of the perpendicular are similar to the whole triangle and to each other.

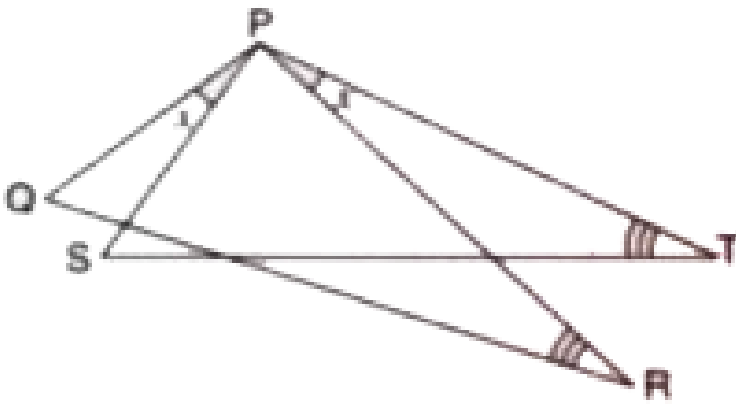
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5. In the given figure, lines l and m are parallel. Three concurrent lines through point O meet line l at points A, B and C , and line m at points P, Q and R as shown. Prove that : $\frac{AB}{BC} = \frac{QR}{PQ}$



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6. In the figure, given alongside, $\angle QPS = \angle RPT$
and $\angle PRQ = \angle PTS$.

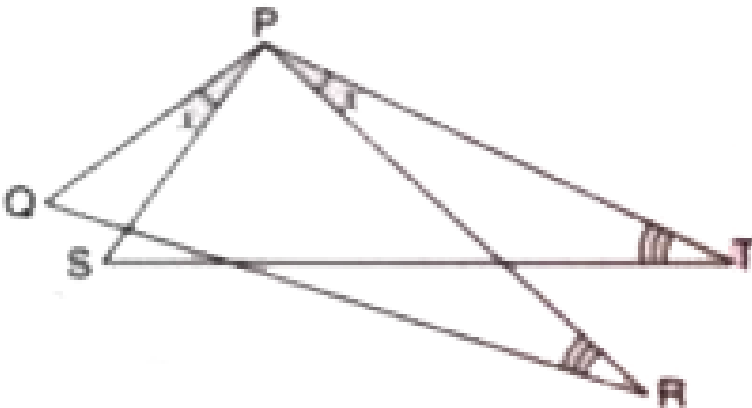


Prove that triangles PQR and PST are similar.

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7. In the figure, given alongside, $\angle QPS = \angle RPT$

and $\angle PRQ = \angle PTS$.

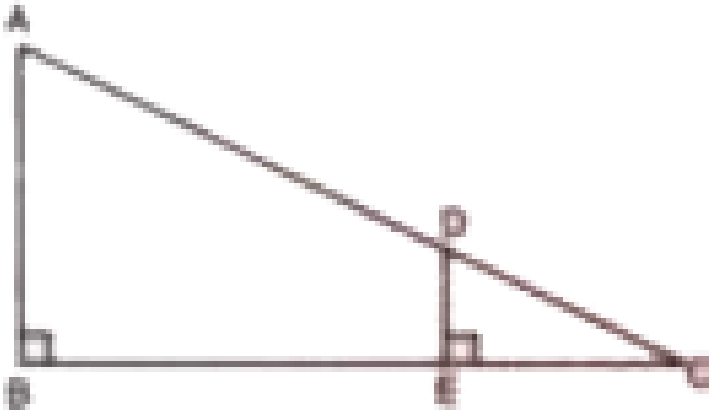


If $PT : ST = 3:4$, find the ratio between $QR : PR$.



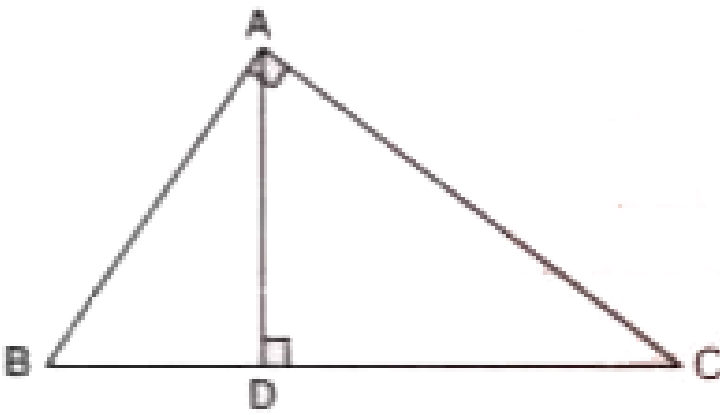
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8. In the given figure, AB and DE are perpendiculars to BC . If $AB = 9$ cm, $DE = 3$ cm and $AC = 24$ cm, calculate AD .



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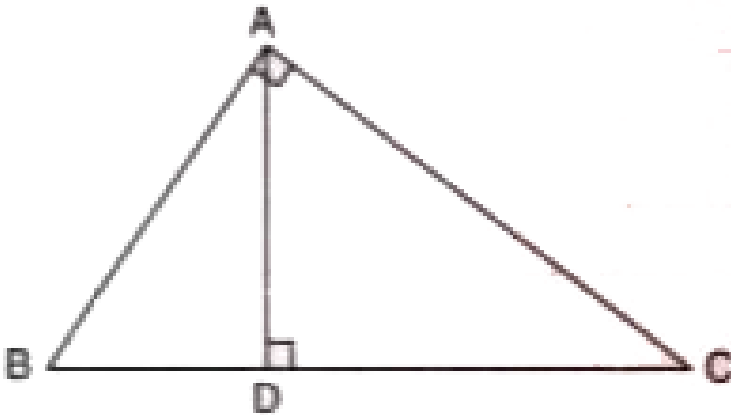
9. In the adjoining figure, ABC is a triangle right-angled at vertex A and AD is altitude.



Prove that : $\triangle ABD$ is similar to $\triangle CAD$.

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10. In the adjoining figure, ABC is a triangle right-angled at vertex A and AD is altitude.



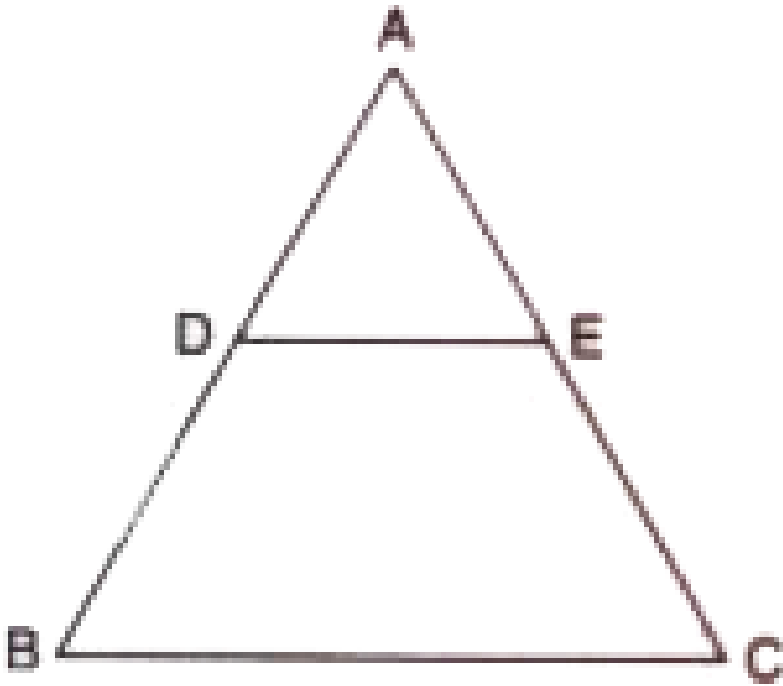
If $BD = 3.6$ cm and $CD = 6.4$ cm, find the length of AD .



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11. In the adjoining figure, $DE \parallel BC$ and D divides AB in the ratio 2 : 3.

Find :



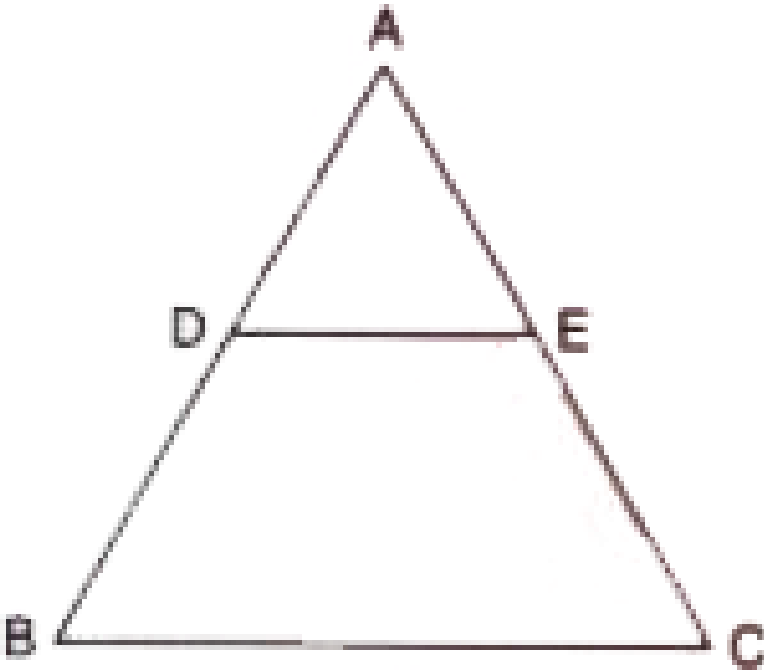
$$\frac{AE}{EC}$$



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12. In the adjoining figure, $DE \parallel BC$ and D divides AB in the ratio 2 : 3.

Find :



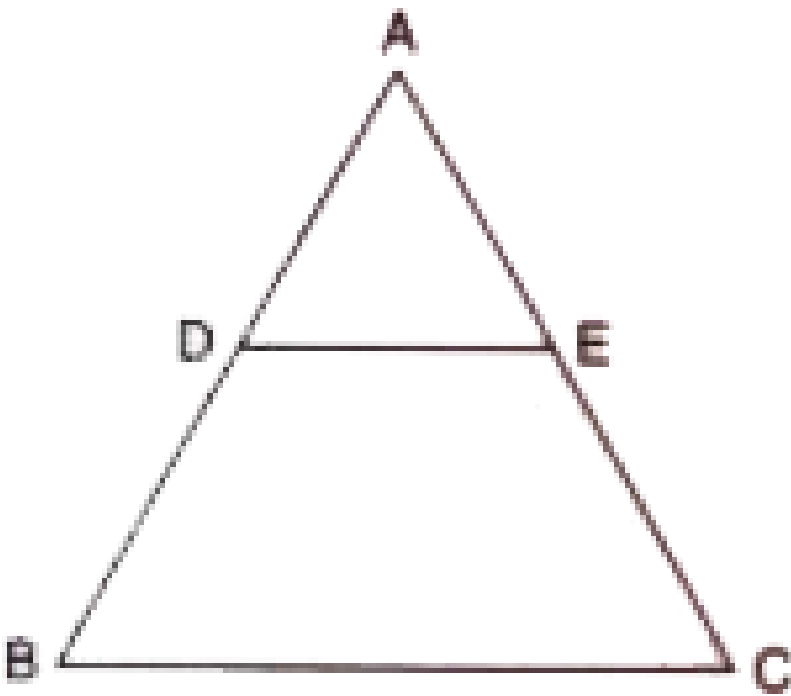
$$\frac{AE}{AC}$$



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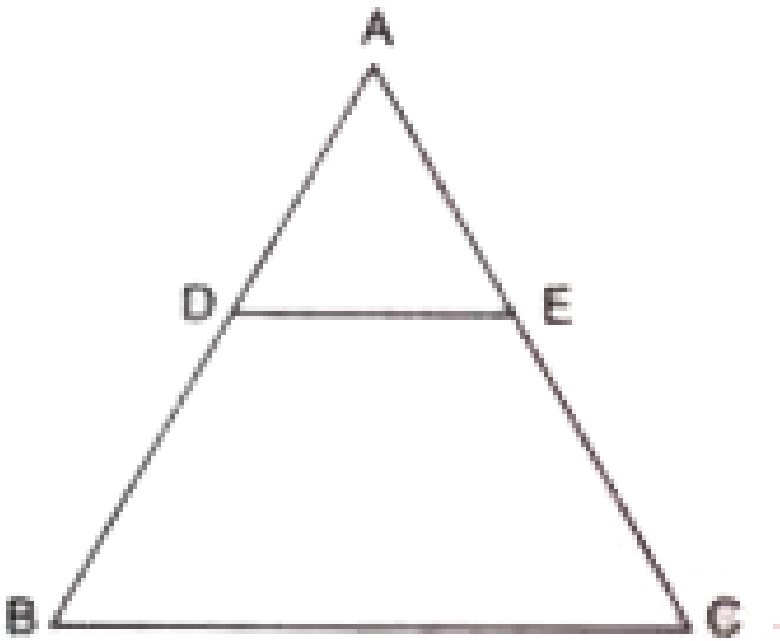
13. In the adjoining figure, $DE \parallel BC$ and D divides AB in the ratio 2 : 3.

Find DE, if BC = 7.5 cm.



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14. In $\triangle ABC$, D and E are points on the sides AB and AC respectively. Find whether $DE \parallel BC$, if :

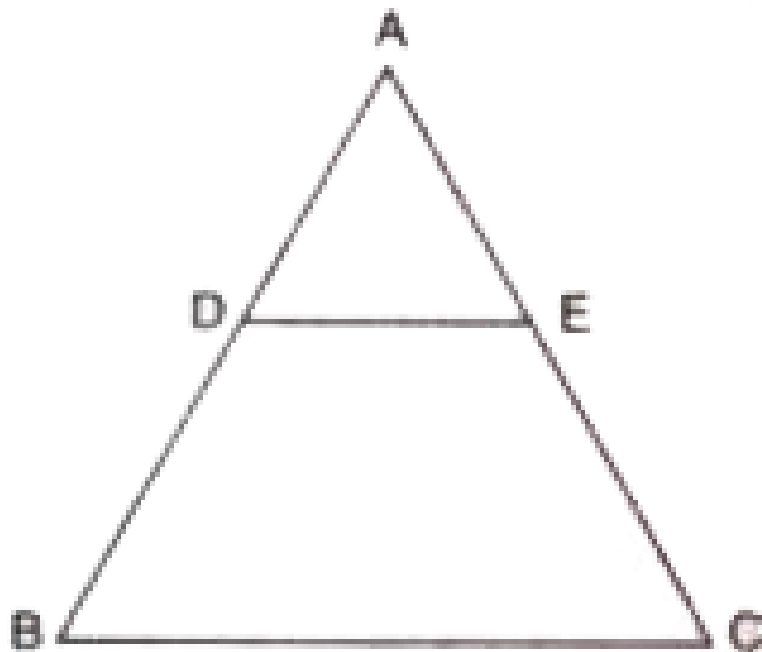


$AD = 3\text{cm}$, $BD = 4.5\text{cm}$, $AE = 4\text{cm}$ and $AC = 10\text{cm}$



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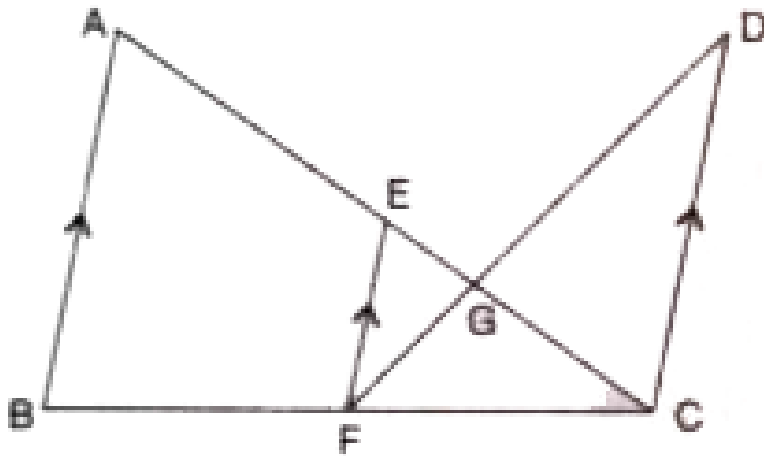
15. In $\triangle ABC$, D and E are points on the sides AB and AC respectively. Find whether $DE \parallel BC$, if :



$AD = 7\text{cm}$, $BD = 45\text{cm}$, $AE = 35\text{cm}$ and $CE = 56\text{cm}$

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16. In the given figure, $AB \parallel EF \parallel CD$. Given that $AB = 7.5\text{ cm}$, $EG = 2.5\text{ cm}$, $GC = 5\text{ cm}$ and $DC = 9\text{ cm}$. Calculate :

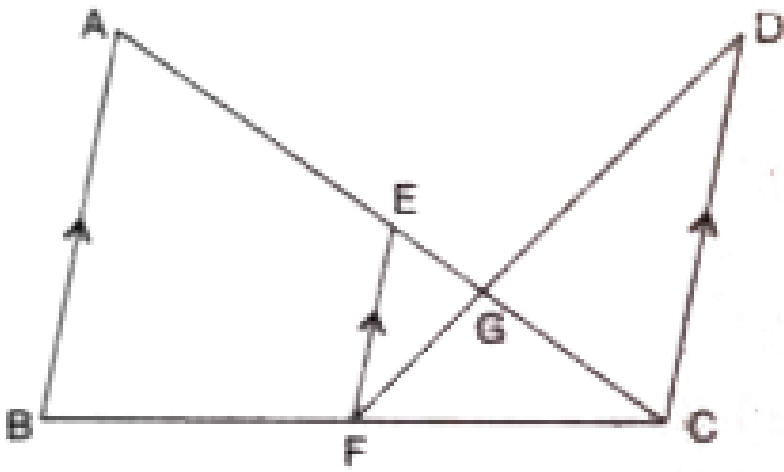


EF



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17. In the given figure, $AB \parallel EF \parallel CD$. Given that $AB = 7.5$ cm, $EG = 2.5$ cm, $GC = 5$ cm and $DC = 9$ cm. Calculate :

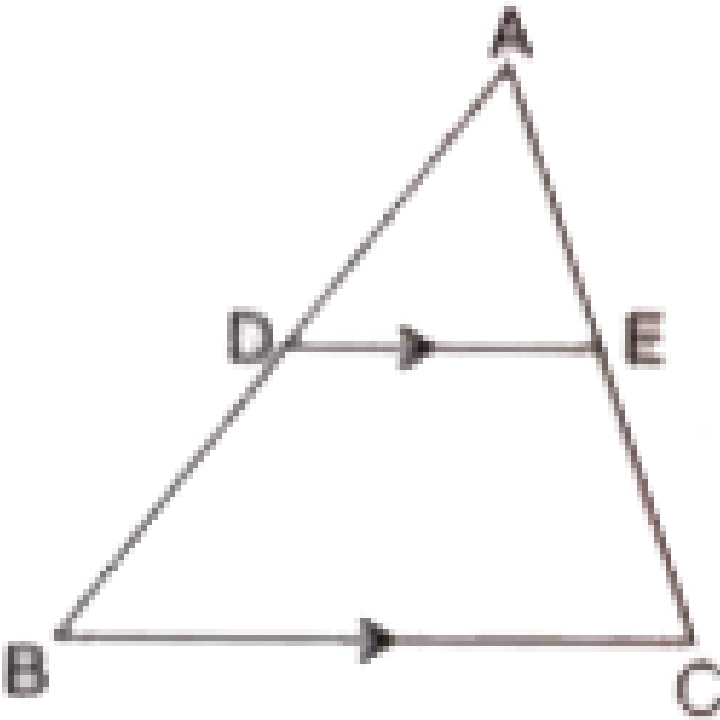


AC.



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18. In the given figure, $DE \parallel BC$.

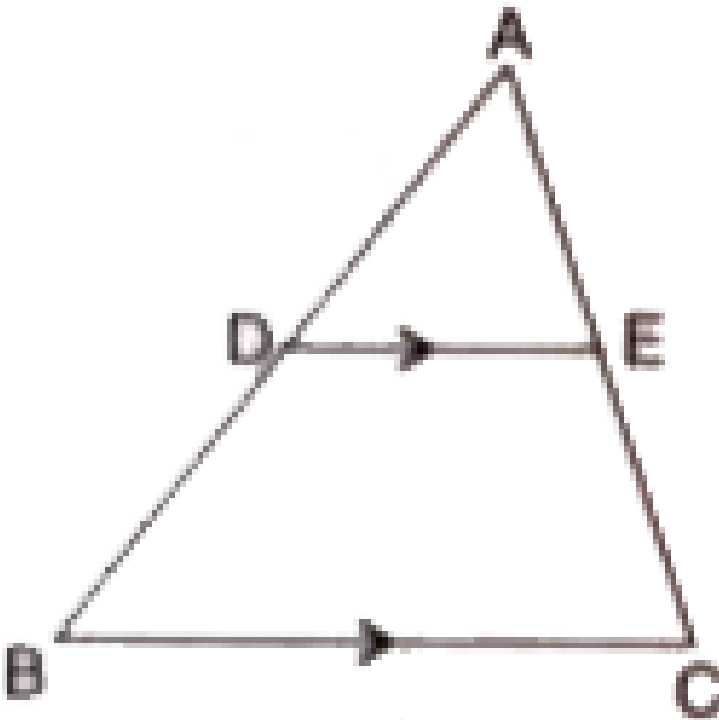


Prove that $\triangle ADE$ and $\triangle ABC$ are similar



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19. In the given figure, $DE \parallel BC$.



Given that $AD = \frac{1}{2}BD$, calculate DE, if $BC = 45$ cm.

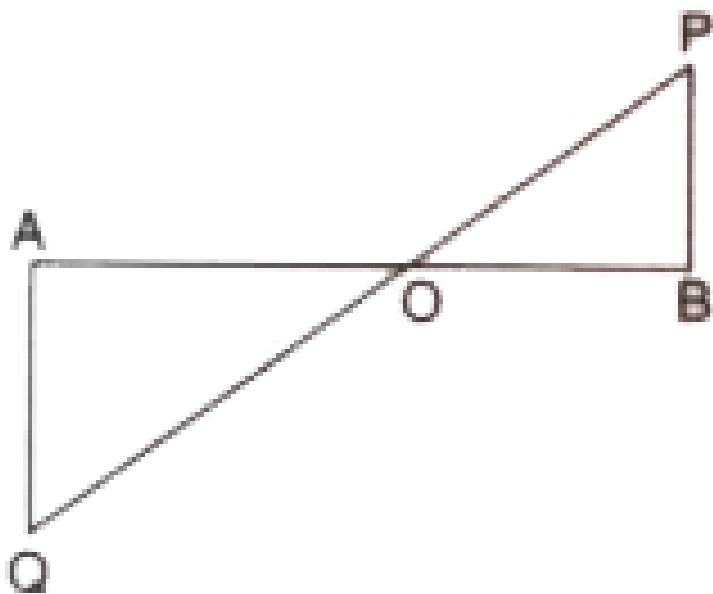
Also, find $\frac{Ar. (\Delta ADE)}{Ar. (\Delta ABC)}$ and $\frac{Ar. (\Delta ADE)}{Ar. (\text{trapezium BCED})}$



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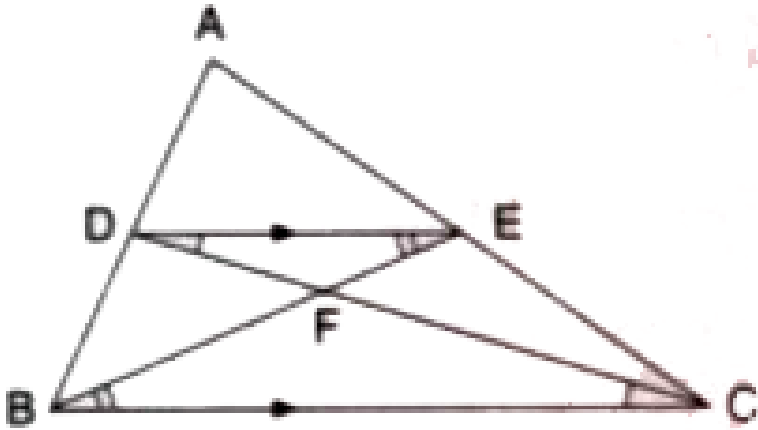
20. In the figure, given alongside, PB and QA are perpendiculars to the line segment AB. If $PO = 6$ cm, $QO = 9$ cm and area of $\Delta POB = 120\text{cm}^2$.

find the area of $\triangle QOA$.



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21. In the given figure, DE is parallel to the base BC of triangle ABC and $AD:DB = 5:3$. Find the ratio :

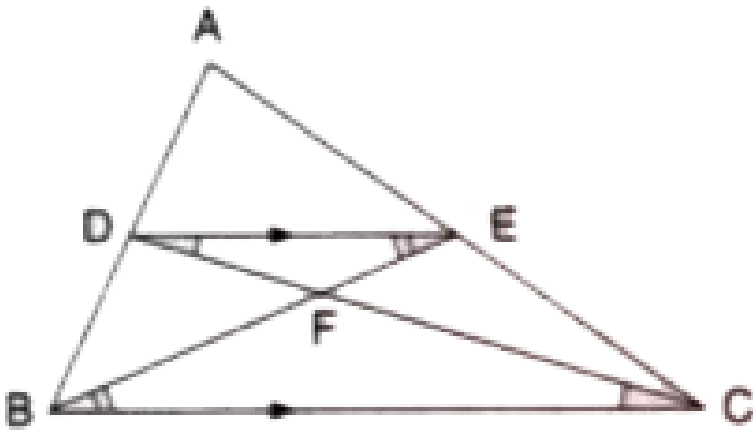


$$\frac{AD}{AB} \text{ and then } \frac{DE}{BC}$$



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22. In the given figure, DE is parallel to the base BC of triangle ABC and AD: DB = 5: 4. Find the ratio :

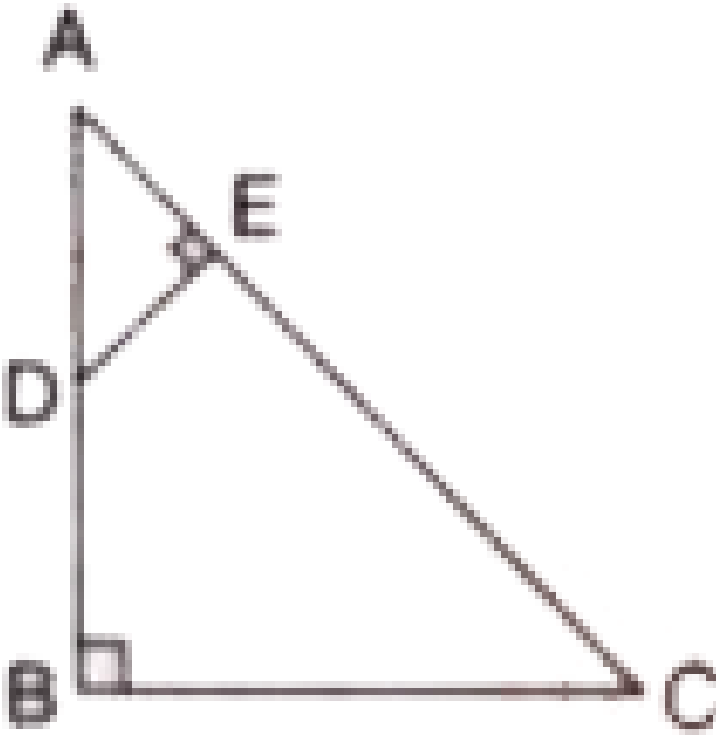


$$\frac{\text{Area of } \triangle DEF}{\text{Area of } \triangle BFC}$$

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23. In $\triangle ABC$, $\angle B = 90^\circ$, $AB = 12\text{cm}$ and $AC = 15\text{cm}$. D and E are points on AB and AC respectively such that $\angle AED = 90^\circ$ and $DE = 3\text{ cm}$.

Calculate the area of $\triangle ABC$ and then the area of $\triangle ADE$.



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24. A model of a ship is made to a scale of 1:200. If the length of the model is 4 m, calculate the length of the ship.

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25. The scale of map is 1 : 50,000. In the map, a triangular plot ABC of land has the following dimensions :

$$AB = 2\text{cm}, BC = 3.5\text{cm} \text{ and angle } ABC = 90^\circ.$$

Calculate : the actual length of side BC, in km, of the land.



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26. The scale of map is 1 : 50,000. In the map, a triangular plot ABC of land has the following dimensions :

$$AB = 2\text{cm}, BC = 3 - 5\text{cm} \text{ and angle } ABC = 90^\circ.$$

Calculate : the area of the plot in sq. km.



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27. A rectangular tank has length = 4 m, width = 3 m and capacity = 30m^3 .

A small model of the tank is made with capacity 240cm^3 . Find :

the dimensions of the model.



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28. A rectangular tank has length = 4 m, width = 3 m and capacity = $30m^3$.

A small model of the tank is made with capacity $240cm^3$. Find :

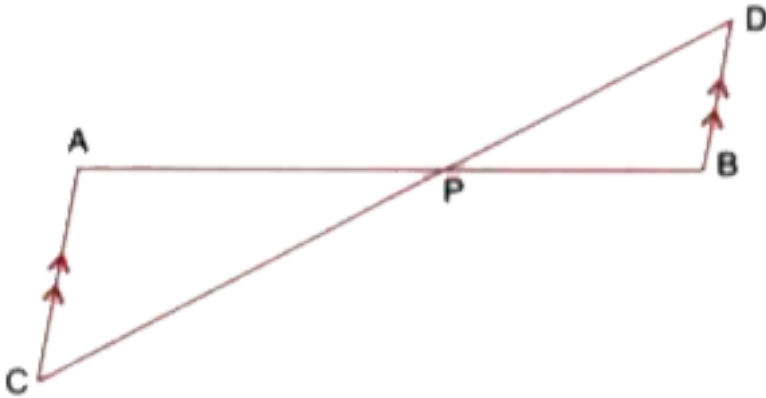
the ratio between the total surface area of the tank and its model.



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Exercise 15 A

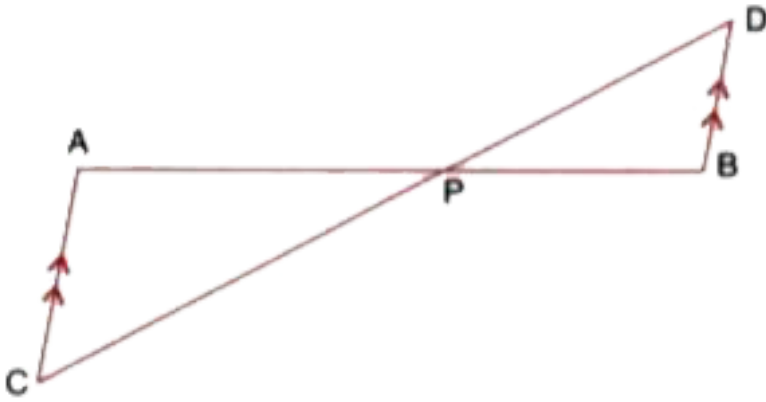
1. In the figure, given below, straight lines AB and CD intersect at P, and $AC \parallel BD$. Prove that :



$\triangle APC$ and $\triangle BPD$ are similar.

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2. In the figure, given below, straight lines AB and CD intersect at P, and $AC \parallel BD$.



If $BD = 2.4$ cm, $AC = 3.6$ cm, $PD = 4.0$ cm and $PB = 3.2$ cm, find the lengths of PA and PC.

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3. In a trapezium ABCD, side AB is parallel to side DC, and the diagonals AC and BD intersect each other at point P. Prove that :

$\triangle APB$ is similar to $\triangle CPD$.



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4. In a trapezium ABCD, side AB is parallel to side DC, and the diagonals AC and BD intersect each other at point P. Prove that :

$$PA \times PD = PB \times PC.$$



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5. P is a point on side BC of a parallelogram ABCD. If DP produced meets AB produced at point L, prove that :

$$DP : PL = DC : BL.$$



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6. P is a point on side BC of a parallelogram ABCD. If DP produced meets AB produced at point L, prove that :

$$DL : DP = AL : DC$$



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7. In quadrilateral ABCD, the diagonals AC and BD intersect each other at point O.

If $AO = 2CO$ and $BO = 2DO$, show that:

$\triangle AOB$ is similar to $\triangle COD$.



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8. In quadrilateral ABCD, the diagonals AC and BD intersect each other at point O.

If $AO = 2CO$ and $BO = 2DO$, show that:

$OA \times OD = OB \times OC$.



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9. In $\triangle ABC$, angle ABC is equal to twice the angle ACB, and bisector of angle ABC meets the opposite side at point P. Show that :

$CB : BA = CP : PA$



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10. In $\triangle ABC$, angle ABC is equal to twice the angle ACB , and bisector of angle ABC meets the opposite side at point P . Show that :

$$AB \times BC = BP \times CA$$



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11. In $\triangle ABC$, $BM \perp AC$ and $CN \perp AB$, show that :

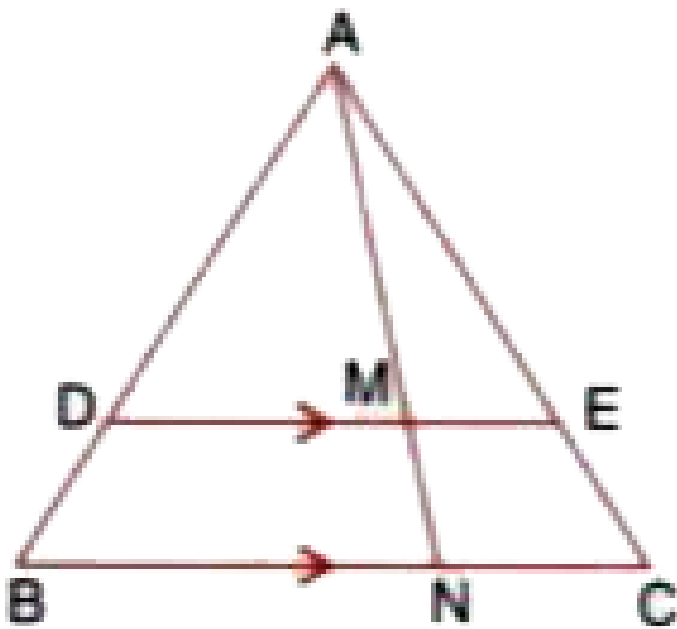
$$\frac{AB}{AC} = \frac{BM}{CN} = \frac{AM}{AN}$$



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12. In the given figure,

$DE \parallel BC$, $AE = 15\text{cm}$, $EC = 9\text{cm}$, $NC = 6\text{cm}$ and $BN = 24\text{cm}$.



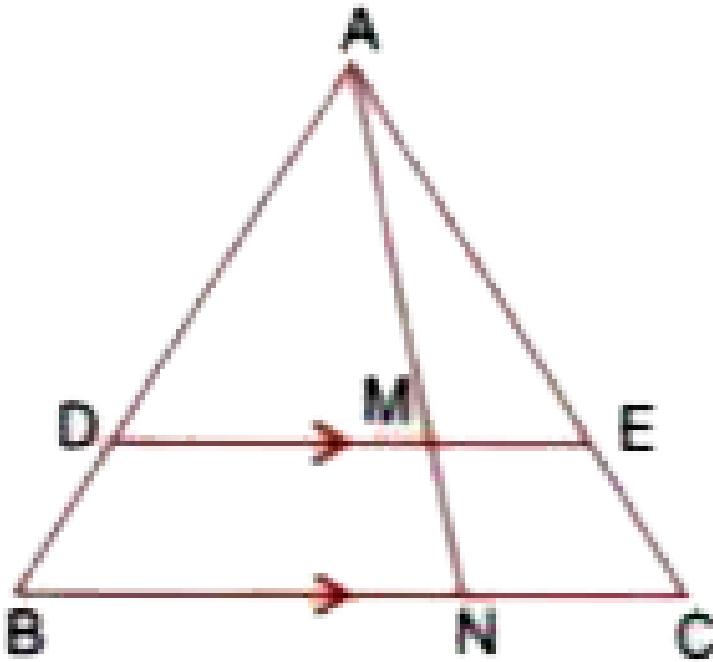
Write all possible pairs of similar triangles.



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13. In the given figure,

$DE \parallel BC$, $AE = 15\text{cm}$, $EC = 9\text{cm}$, $NC = 6\text{cm}$ and $BN = 24\text{cm}$.

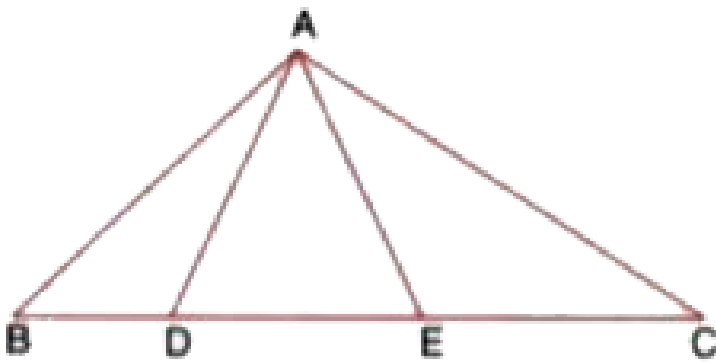


Find lengths of ME and DM.

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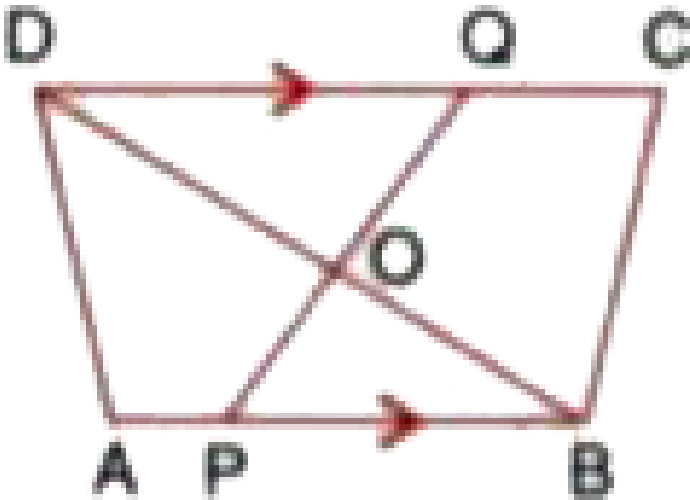
14. In the given figure, $AD = AE$ and $AD^2 = BD \times EC$.

Prove that : triangles ABD and CAE are similar.



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15. In the given figure, $AB \parallel DC$, $BO = 6\text{cm}$ and $DQ = 8\text{cm}$, find:
 $BP \times DO$.



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16. Angle BAC of triangle ABC is obtuse and $AB = AC$. P is a point in BC such that $PC = 12$ cm. PQ and PR are perpendiculars to sides AB and AC respectively. If $PQ = 15$ cm and $PR = 9$ cm, find the length of PB.



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17. State, true or false :

Two similar polygons are necessarily congruent.



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18. State, true or false :

Two congruent polygons are necessarily similar.



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19. State, true or false :

All equiangular triangles are similar.

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20. State, true or false :

All isosceles triangles are similar.

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21. State, true or false :

Two isosceles-right triangles are similar.

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22. State, true or false :

Two isosceles triangles are similar, if an angle of one is congruent to the

corresponding angle of the other.



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23. State, true or false :

The diagonals of a trapezium divide each other into proportional segments.

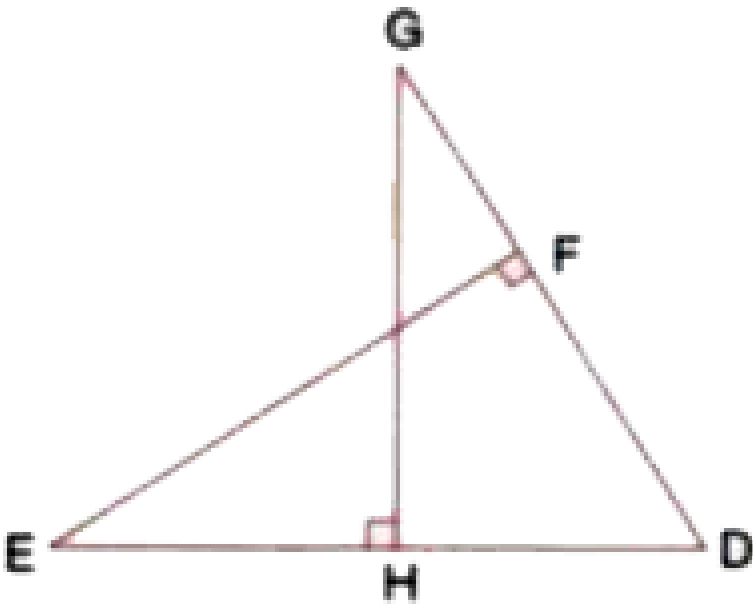


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24. Given : $\angle GHE = \angle DFE = 90^\circ$,

$DH = 8$, $DF = 12$,

$DG = 3x - 1$ and $DE = 4x + 2$.



Find : the lengths of segments DG and DE.

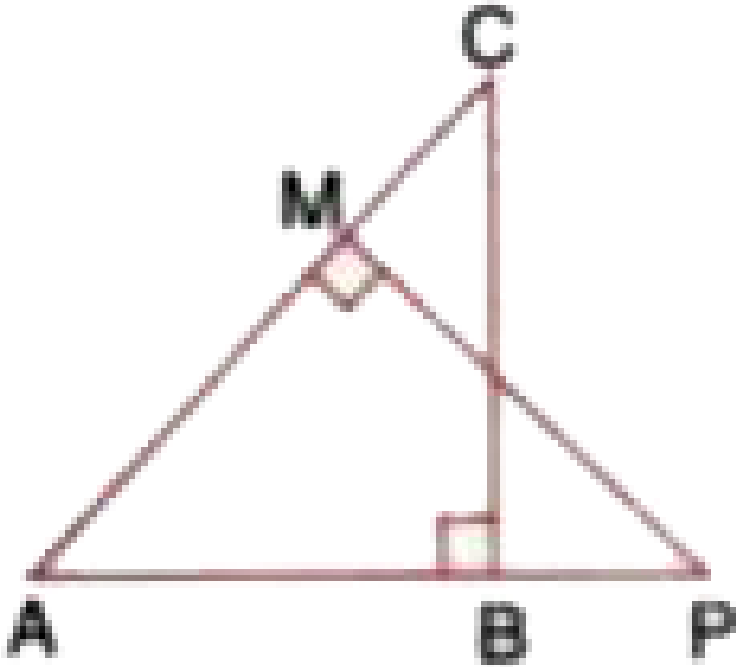
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25. D is a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$. Show that $CA^2 = CB \cdot CD$.

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26. In the given figure, $\triangle ABC$ and $\triangle AMP$ are right angled at B and M respectively.

Given $AC = 10\text{cm}$, $AP = 15\text{cm}$ and $PM = 12\text{cm}$.

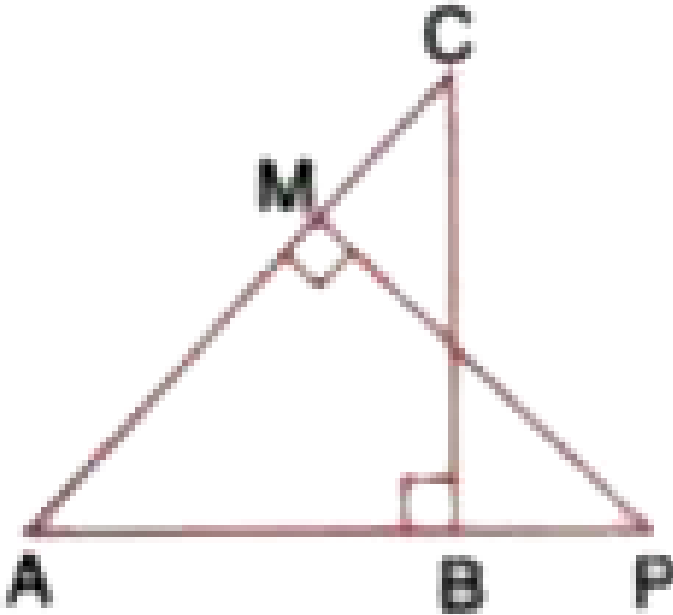


Prove that : $\triangle ABC \sim \triangle AMP$

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27. In the given figure, $\triangle ABC$ and $\triangle AMP$ are right angled at B and M respectively.

Given $AC = 10\text{cm}$, $AP = 15\text{cm}$ and $PM = 12\text{cm}$.



Find : AB and BC.

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28. Given : RS and PT are altitudes of $\triangle PQR$. Prove that:

$\triangle PQT \sim \triangle QRS$.

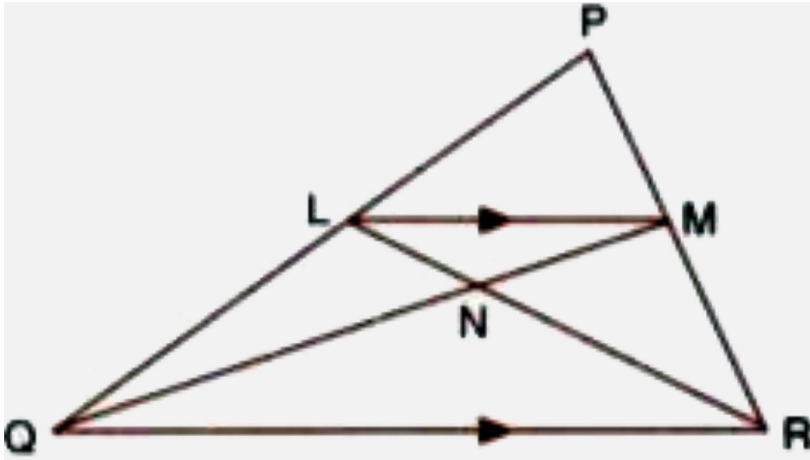
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29. Given : RS and PT are altitudes of $\triangle PQR$. Prove that:

$$PQ \times QS = RQ \times QT.$$

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30. Given : ABCD is a rhombus, DPR and CBR are straight lines.

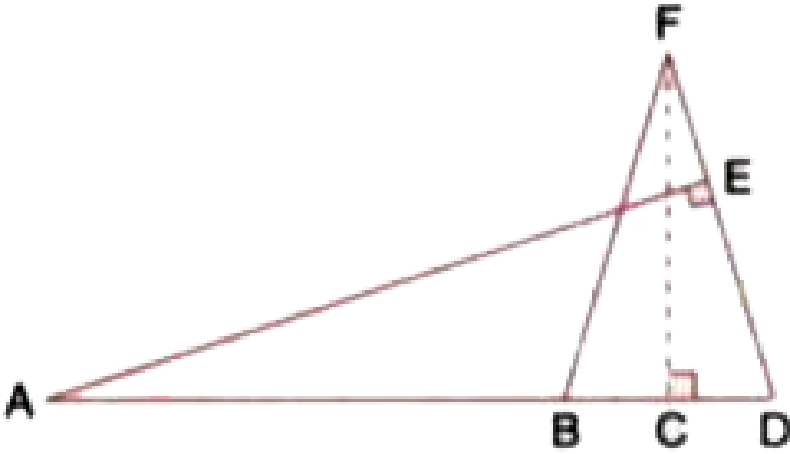


Prove that : $DP \times CR = DC \times PR$.

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31. Given : $FB = FD$, $AE \perp FD$ and $FC \perp AD$.

Prove that : $\frac{FB}{AD} = \frac{BC}{ED}$



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32. In ΔPQR , $\angle Q = 90^\circ$ and QM is perpendicular to PR . Prove that :

$$PQ^2 = PM \times PR$$

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33. In $\triangle PQR$, $\angle Q = 90^\circ$ and QM is perpendicular to PR . Prove that :

$$QR^2 = PR \times MR$$

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34. In $\triangle PQR$, $\angle Q = 90^\circ$ and QM is perpendicular to PR . Prove that :

$$PQ^2 + QR^2 = PR^2$$

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35. In $\triangle ABC$, $\angle B = 90^\circ$ and $BD \perp AC$.

If $CD = 10$ cm and $BD = 8$ cm, find AD .

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36. In $\triangle ABC$, $\angle B = 90^\circ$ and $BD \perp AC$.

If $AC = 18$ cm and $AD = 6$ cm, find BD .

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37. In $\triangle ABC$, $\angle B = 90^\circ$ and $BD \perp AC$.

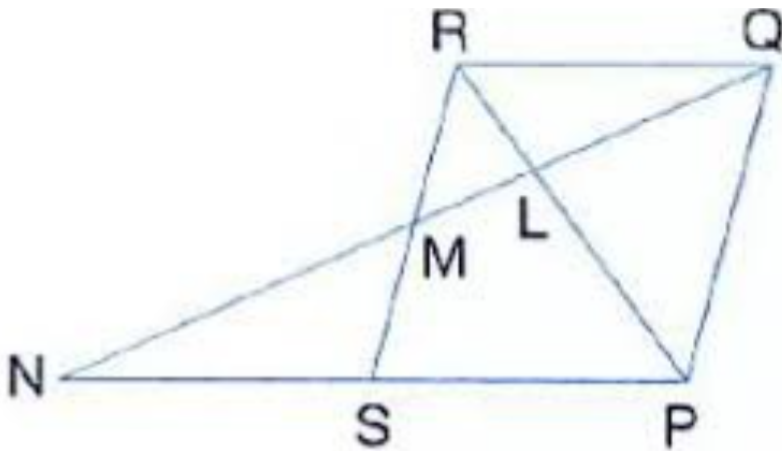
If $AC = 9$ cm and $AB = 7$ cm, find AD .

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38. In the figure, PQRS is a parallelogram with $PQ = 16$ cm and $QR = 10$ cm.

L is a point on PR such that $RL:LP = 2:3$. QL produced meets RS at M and PS produced at N.

Find the lengths of PN and RM.



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39. In quadrilateral ABCD, diagonals AC and BD intersect at point E such that

$$AE:EC = BE:ED.$$

Show that : ABCD is a trapezium.

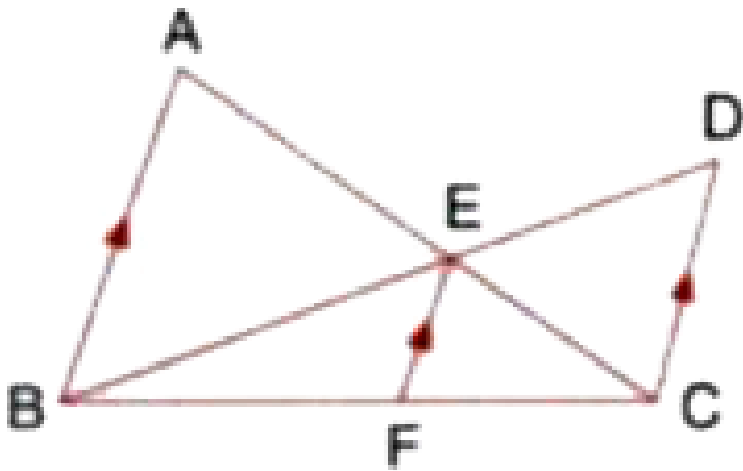
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40. In triangle ABC , AD is perpendicular to side BC and $AD^2 = BD \times DC$.

Show that angle $BAC = 90^\circ$.

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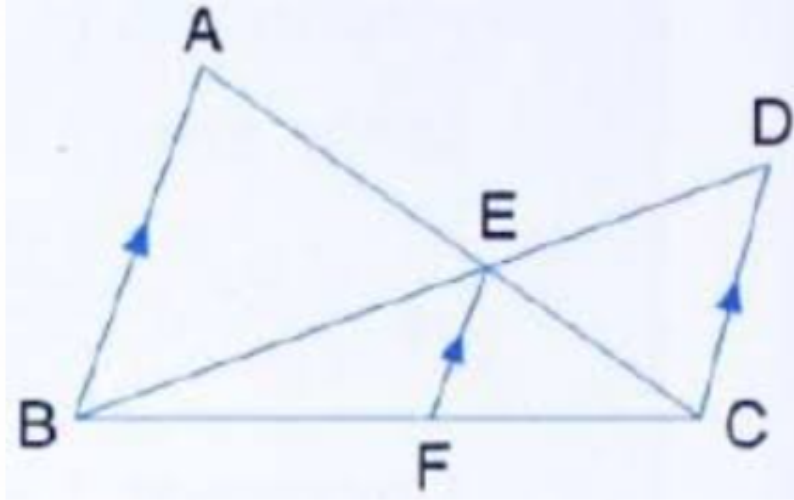
41. In the given figure, $AB \parallel EF \parallel DC$, $AB = 67.5\text{cm}$, $DC = 40.5\text{cm}$ and $AE = 52.5\text{cm}$.



Name the three pairs of similar triangles.

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42. In the given figure, $AB \parallel EF \parallel DC$, $AB = 67.5\text{cm}$, $DC = 40.5\text{cm}$ and $AE = 52.5\text{cm}$.

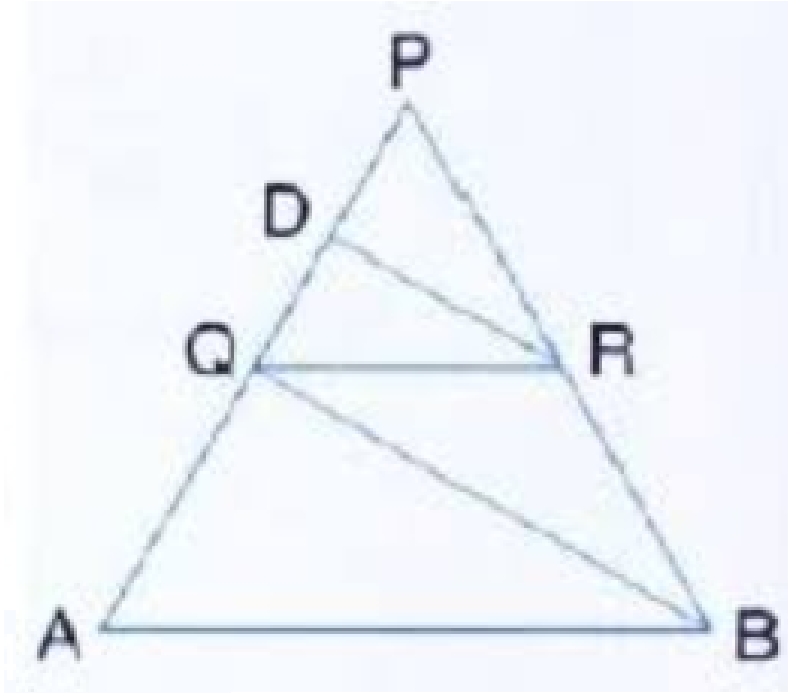


Find the lengths of EC and EF .



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43. In the given figure, QR is parallel to AB and DR is parallel to QB .



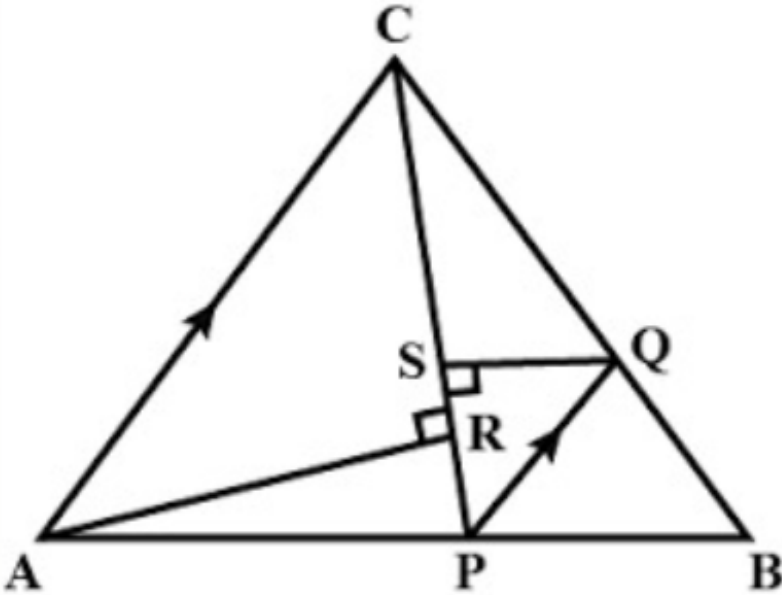
Prove that : $PQ^2 = PD \times PA$.

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

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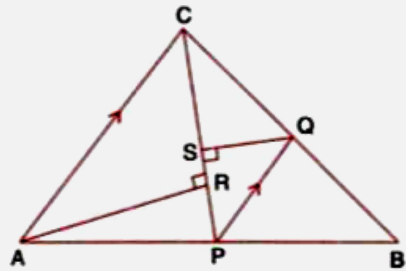
45. In the given figure, P is a point on AB such that $AP:PB = 4:3$. PQ is parallel to AC.



Calculate the ratio $PQ : AC$, giving reason for your answer.

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46. In the given figure, P is a point on AB such that $AP:PB = 4:3$. PQ is parallel to AC.

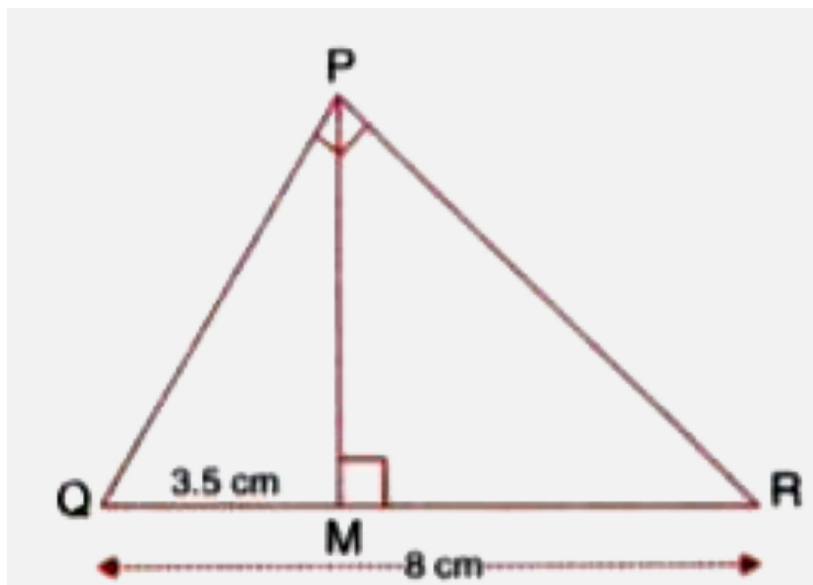


In triangle ARC , $\angle ARC = 90^\circ$ and in triangle PQS , $\angle PSQ = 90^\circ$.

Given $QS = 6\text{cm}$, calculate the length of AR .

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47. In the right-angled triangle QPR , PM altitude.



Given that $QR = 8\text{ cm}$ and $MQ = 3.5\text{ cm}$, calculate the value of PR .

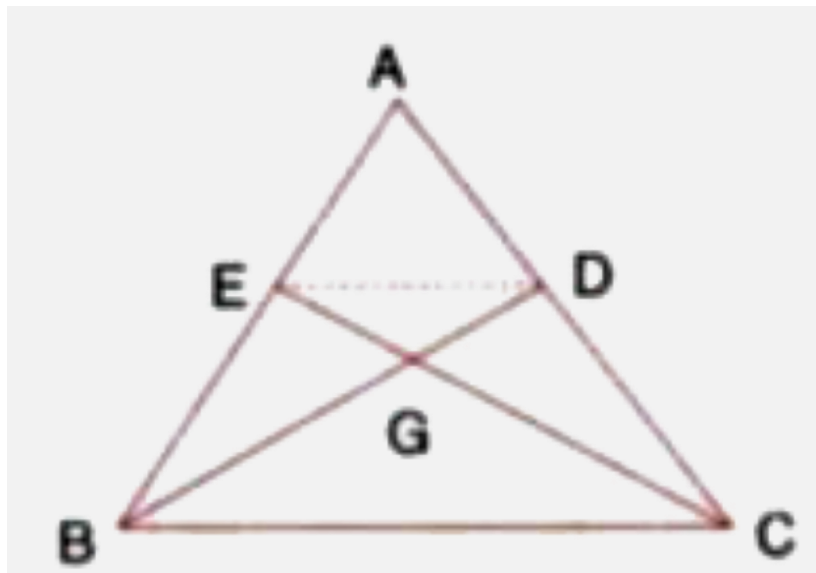


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48. In the figure, given below, the medians BD and CE of a triangle ABC meet at G . Prove that:



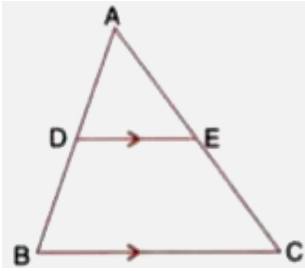
$\triangle EGD \sim \triangle CGB$ and (ii) $BG = 2GD$ from (i) above.



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Exercise 15 B

1. In the following figure, point D divides AB in the ratio 3: 5. Find :

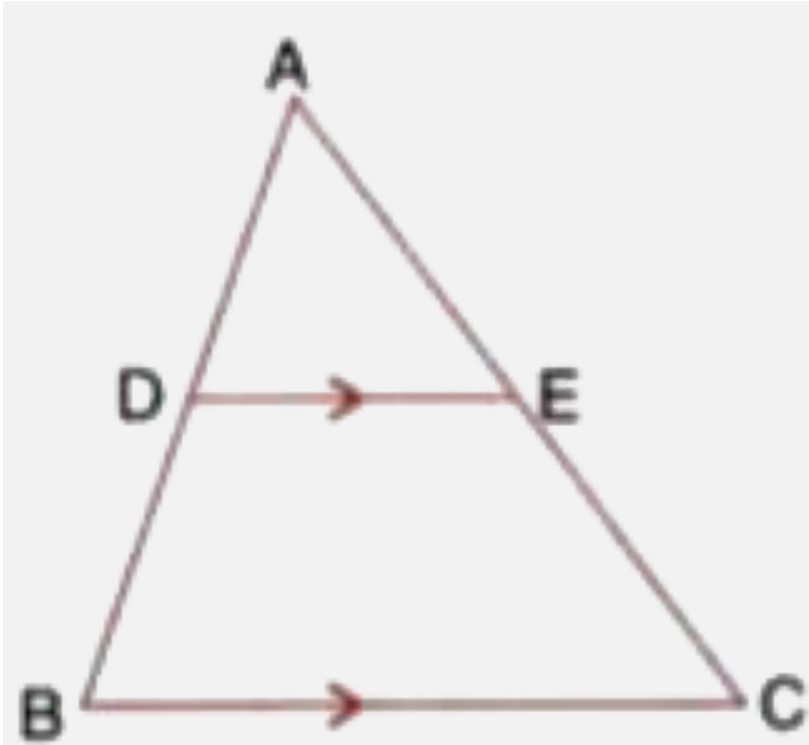


$$\frac{AE}{EC}$$



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2. In the following figure, point D divides AB in the ratio 3: 5. Find :

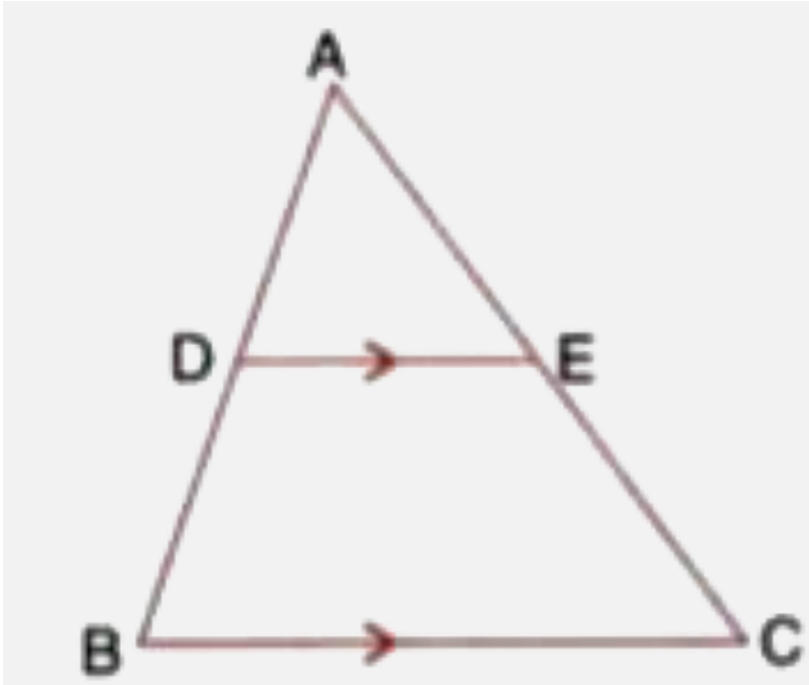


$$\frac{AD}{AB}$$



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3. In the following figure, point D divides AB in the ratio 3: 5. Find :

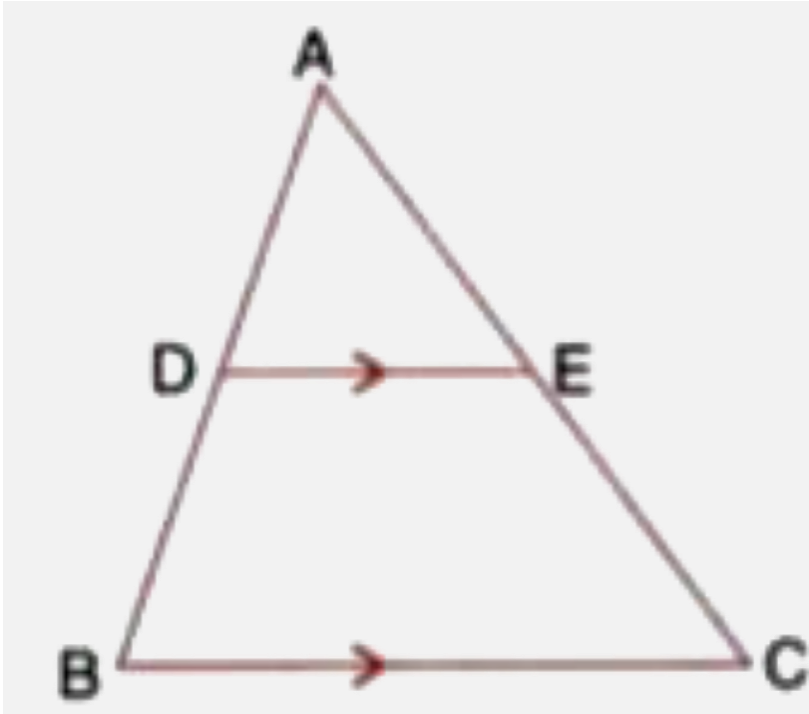


$$\frac{AE}{AC}$$



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4. In the following figure, point D divides AB in the ratio 3: 5. Find :



Also, if:

DE = 24 cm, find the length of BC.

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5. In the following figure, point D divides AB in the ratio 3: 5. Find :



Also if :

BC = 4.8 cm, find the length of DE.

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6. In the given figure, $PQ \parallel AB$, $CQ = 4.8$ cm $QB = 3.6$ cm and $AB = 6.3$ cm.

Find :



$$\frac{CP}{PA}$$

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7. In the given figure, $PQ \parallel AB$, $CQ = 4.8$ cm $QB = 3.6$ cm and $AB = 6.3$ cm.

Find :



PQ

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8. In the given figure, $PQ \parallel AB$, $CQ = 4.8$ cm $QB = 3.6$ cm and $AB = 6.3$ cm.

Find :



PQ



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9. A line PQ is drawn parallel to the side BC of $\triangle ABC$ which cuts side AB at P and side AC at Q . If $AB = 90$ cm, $CA = 60$ cm and $AQ = 4.2$ cm, find the length of AP .



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10. In $\triangle ABC$, D and E are the points on sides AB and AC respectively.

Find whether $DE \parallel BC$, if :

$AB = 9$ cm, $AD = 4$ cm, $AE = 6$ cm and $EC = 7.5$ cm.



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11. In $\triangle ABC$, D and E are the points on sides AB and AC respectively.

Find whether $DE \parallel BC$, if :

$AB = 6.3$ cm, $EC = 11.0$ cm, $AD = 0.8$ cm and $AE = 1.6$ cm.



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12. In the given figure, $\triangle ABC \sim \triangle ADE$. If $AE:EC = 4:7$ and $DE = 6.6$ cm, find BC . If ' x ' be the length of the perpendicular from A to DE , find the length of perpendicular from A to BC in terms of ' x '.



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13. A line segment DE is drawn parallel to base BC of $\triangle ABC$ which cuts AB at point D and AC at point E . If $AB = 5 BD$ and $EC = 3.2$ cm, find the length of AE .



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14. In the figure, given below, AB, CD and EF are parallel lines. Given AB = 7.5 cm, DC = y cm, EF = 4.5 cm, BC = x cm and CE = 3 cm, calculate the values of x and y.

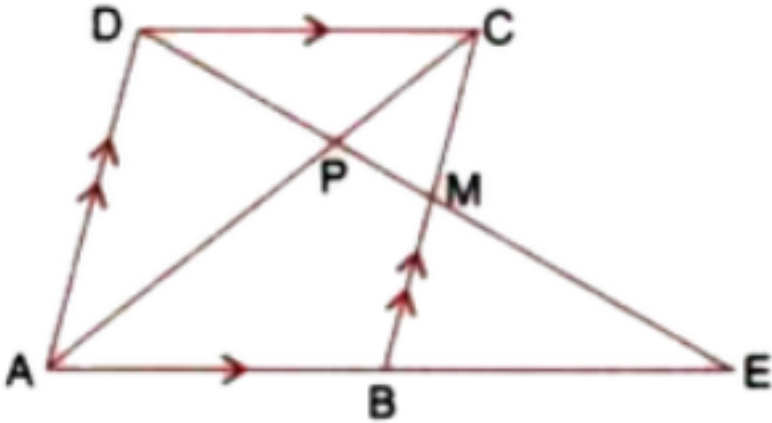
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15. In the figure, given below, PQR is a right angled triangle right angled at Q. XY is parallel to QR, PQ = 6 cm, PY = 4 cm and $PX : XQ = 1:2$. Calculate the lengths of PR and QR.

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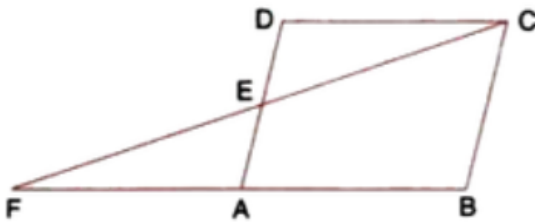
16. In the following figure, M is mid-point of BC of a parallelogram ABCD. DM intersects the diagonal AC at P and AB produced at E. Prove that : PE =

2 PD .



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17. The given figure shows a parallelogram ABCD. E is a point in AD and CE produced meets BA produced at point F. If $AE = 4$ cm, $AF = 8$ cm and $AB = 12$ cm, find the perimeter of the parallelogram ABCD.



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Exercise 15 C

1. The ratio between the corresponding sides of two similar triangles is 2 is to 5. Find the ratio between the areas of these triangles.

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2. Areas of two similar triangles are 98 sq. cm and 128 sq. cm. Find the ratio between the lengths of their corresponding sides.

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3. A line PQ is drawn parallel to the base BC of $\triangle ABC$ which meets sides AB and AC at points P and Q respectively. If $AP = \frac{1}{3}PB$, find the value of

:

$$\frac{\text{Area of } \triangle ABC}{\text{Area of } \triangle APQ}$$

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4. A line PQ is drawn parallel to the base BC of $\triangle ABC$ which meets sides AB and AC at points P and Q respectively. If $AP = \frac{1}{3}PB$, find the value of

:

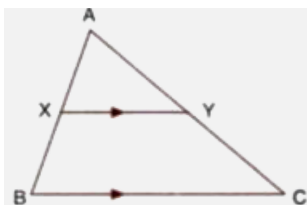
$$\frac{\text{Area of } \triangle APQ}{\text{Area of trapezium } PBCQ}$$

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5. The perimeters of two similar triangles are 30 cm and 24 cm. If one side of the first triangle is 12 cm, determine the corresponding side of the second triangle.

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6. In the given figure, $AX : XB = 3 : 5$

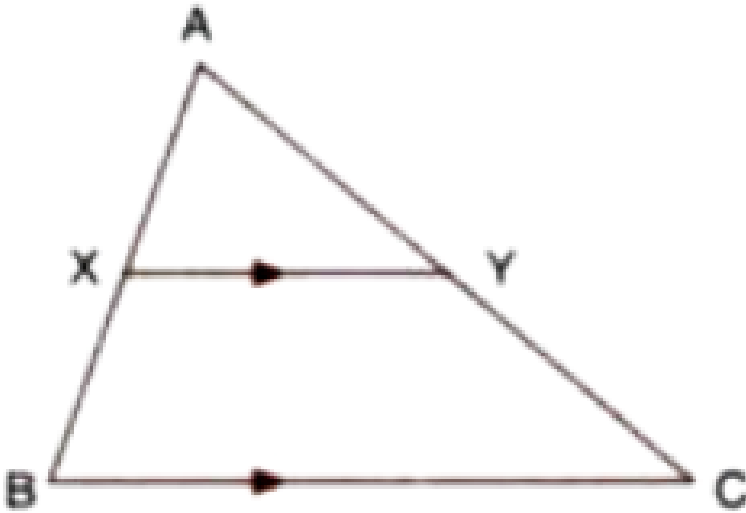


Find :

the length of BC, if the length of XY is 18 cm.

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7. In the given figure, $AX : XB = 3 : 5$



Find :

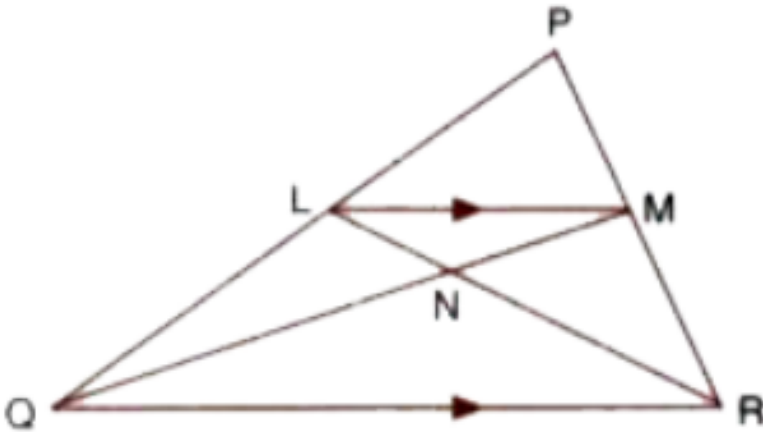
the ratio between the areas of trapezium XBCY and triangle ABC.

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8. ABC is a triangle. PQ is a line segment intersecting AB in P and AC in Q such that $PQ \parallel BC$ and divides triangle ABC into two parts equal in area. Find the value of ratio BP: AB.

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9. In the given triangle PQR, LM is parallel to QR and $PM : MR = 3 : 4$.

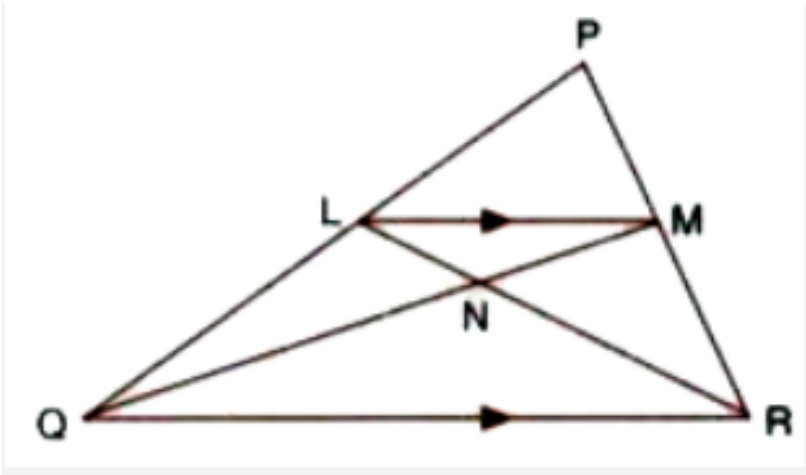


Calculate the value of ratio :

$$\frac{PL}{PQ} \text{ and then } \frac{LM}{QR}$$

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10. In the given triangle PQR, LM is parallel to QR and $PM : MR = 3 : 4$.

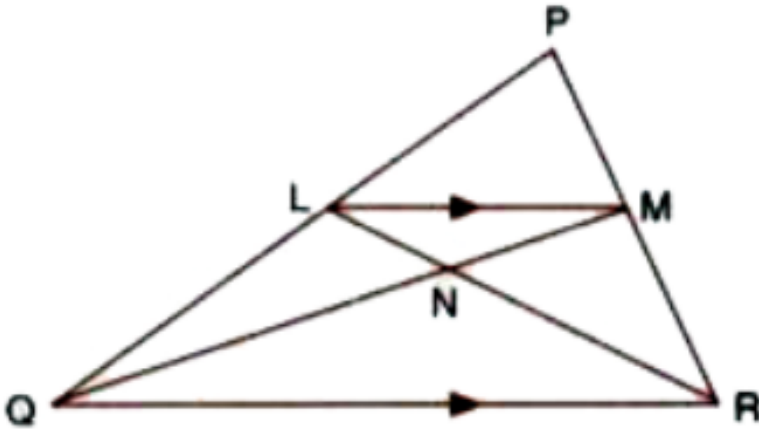


Calculate the value of ratio :

$$\frac{\text{Area of } \triangle LMN}{\text{Area of } \triangle MNR}$$

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11. In the given triangle PQR, LM is parallel to QR and $PM : MR = 3 : 4$.

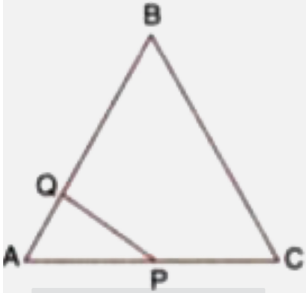


Calculate the value of ratio :

$$\frac{\text{Area of } \triangle LQM}{\text{Area of } \triangle LQN}$$

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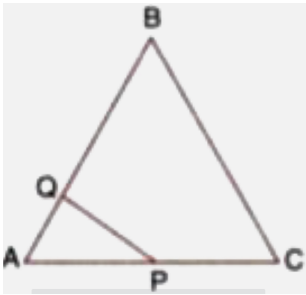
12. The given diagram shows two isosceles triangles which are similar. In the given diagram, PQ and BC are not parallel, $PC = 4$, $AQ = 3$, $QB = 12$, $BC = 15$ and $AP = PQ$. Calculate :



the length of AP.

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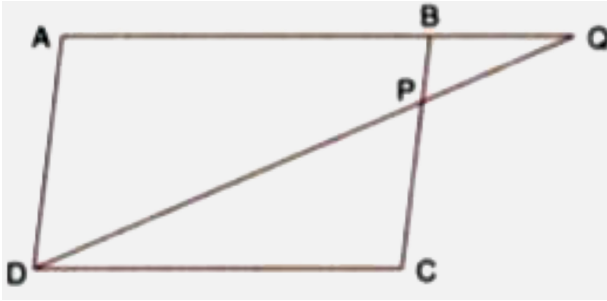
13. The given diagram shows two isosceles triangles which are similar. In the given diagram, PQ and BC are not parallel, $PC = 4$, $AQ = 3$, $QB = 12$, $BC = 15$ and $AP = PQ$. Calculate :



the ratio of the areas of triangle APQ and triangle ABC.

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14. In the figure, given below, ABCD is a parallelogram. P is a point on BC such that $BP : PC = 1 : 2$. DP produced meets AB produced at Q. Given the area of triangle $CPQ = 20\text{cm}^2$

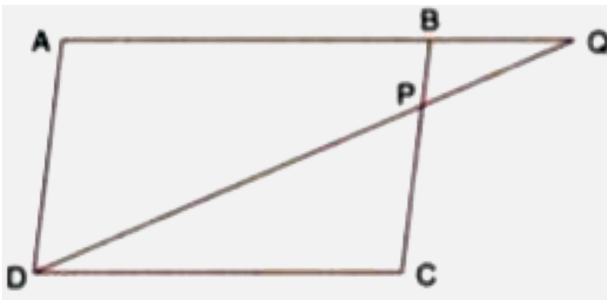


Calculate :

area of triangle CDP.

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15. In the figure, given below, ABCD is a parallelogram. P is a point on BC such that $BP : PC = 1 : 2$. DP produced meets AB produced at Q. Given the area of triangle $CPQ = 20\text{cm}^2$



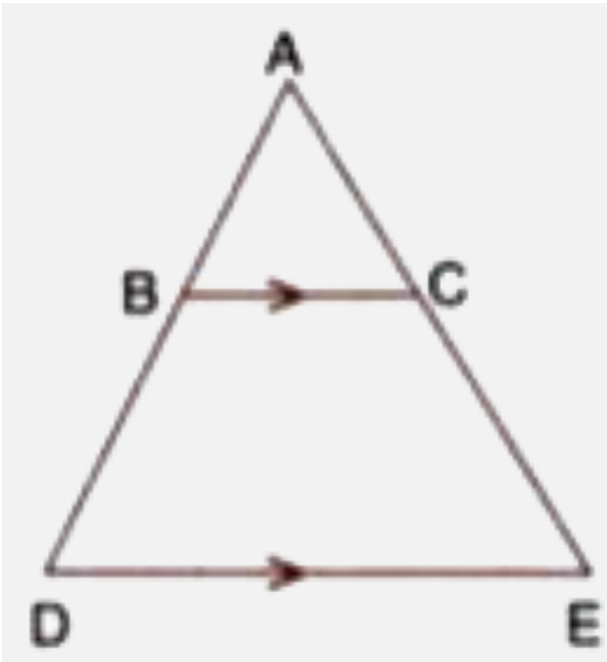
Calculate :

area of parallelogram ABCD.

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16. In the given figure, BC is parallel to DE. Area of triangle $ABC = 25\text{cm}^2$, Area of trapezium $BCED = 24\text{cm}^2$ and $DE = 14\text{cm}$. Calculate the length of BC.

Also, find the area of triangle BCD.



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17. The given figure shows a trapezium in which AB is parallel to DC and diagonals AC and BD intersect at point P. If $AP : CP = 3:5$,



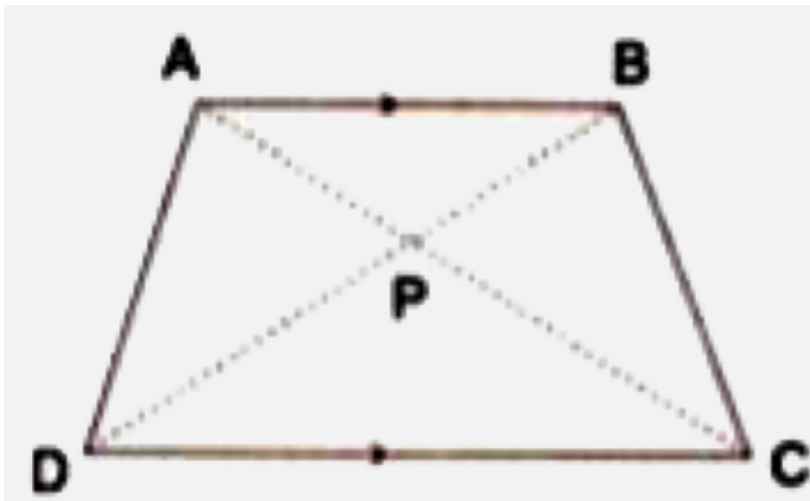
Find :

$$\Delta APB : \Delta CPB$$



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18. The given figure shows a trapezium in which AB is parallel to DC and diagonals AC and BD intersect at point P. If $AP : CP = 3:5$,



Find :

$$\triangle DPC : \triangle APB$$



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19. The given figure shows a trapezium in which AB is parallel to DC and diagonals AC and BD intersect at point P. If $AP : CP = 3:5$,



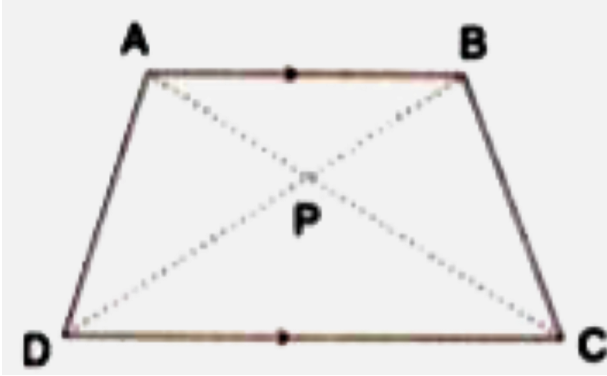
Find :

$$\triangle ADP : \triangle APB$$



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20. The given figure shows a trapezium in which AB is parallel to DC and diagonals AC and BD intersect at point P. If $AP : CP = 3:5$,



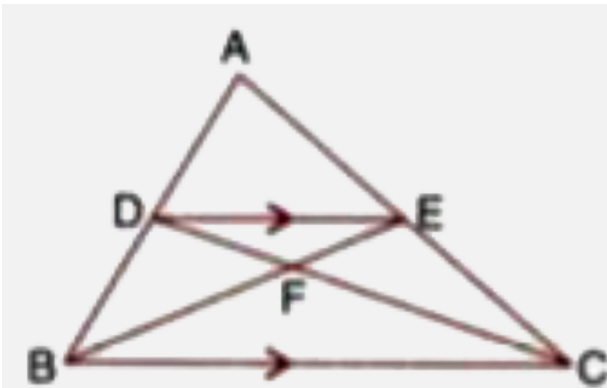
Find :

$$\triangle APB : \triangle ADB$$

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21. In the given figure, ABC is a triangle. DE is parallel to BC and

$$\frac{AD}{DB} = \frac{3}{2}$$



Determine the ratios and $\frac{AD}{AB}$

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22. In the given figure, ABC is a triangle. DE is parallel to BC and

$$\frac{AD}{DB} = \frac{3}{2}$$



Prove that $\triangle DEF$ is similar to $\triangle CBF$. Hence, find $\frac{EF}{FB}$.

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23. In the given figure, ABC is a triangle. DE is parallel to BC and

$$\frac{AD}{DB} = \frac{3}{2}$$

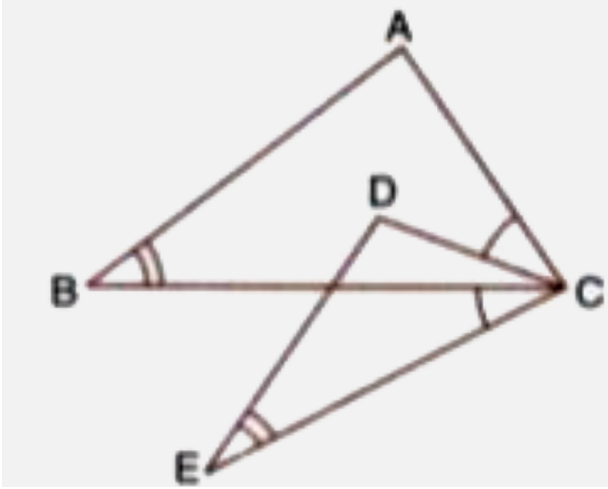


What is the ratio of the areas of $\triangle DEF$ and $\triangle BFC$?

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24. In the given figure, $\angle B = \angle E$, $\angle ACD = \angle BCE$, $AB = 10.4$ cm and

$DE = 7.8$ cm. Find the ratio between areas of the $\triangle ABC$ and $\triangle DEC$.



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Exercise 15 D

1. A triangle ABC has been enlarged by scale factor $m = 2.5$ to the triangle $A'B'C'$. Calculate :
- the length of AB, if $A'B' = 6$ cm.

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2. A triangle ABC has been enlarged by scale factor $m = 2.5$ to the triangle A' B'C' Calculate :

the length of C'A' if CA = 4 cm.



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3. A triangle LMN has been reduced by scale factor 0.8 to the triangle L' M' N'. Calculate:

the length of M' N', if MN = 8 cm.



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4. A triangle LMN has been reduced by scale factor 0.8 to the triangle L' M' N'. Calculate:

the length of LM, if L' M' = 5-4 cm.



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5. A triangle ABC is enlarged, about the point O as centre of enlargement, and the scale factor is 3. Find :

A' B', if AB = 4 cm.



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6. A triangle ABC is enlarged, about the point O as centre of enlargement, and the scale factor is 3. Find :

BC, if B'C' = 15 cm.



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7. A triangle ABC is enlarged, about the point O as centre of enlargement, and the scale factor is 3. Find :

OA, if OA' = 6 cm.



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8. A triangle ABC is enlarged, about the point O as centre of enlargement, and the scale factor is 3. Find :
OC', if OC = 21 cm.



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9. A triangle ABC is enlarged, about the point O as centre of enlargement, and the scale factor is 3. Find state the value of :

$$\frac{OB'}{OB}$$



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10. A triangle ABC is enlarged, about the point O as centre of enlargement, and the scale factor is 3. Find state the value of :

$$\frac{C'A'}{CA}$$



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11. A model of an aeroplane is made to a scale of 1 : 400. Calculate :
the length, in cm, of the model, if the length of the aeroplane is 40 m.

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12. A model of an aeroplane is made to a scale of 1 : 400. Calculate :
the length, in m, of the aeroplane, if length of its model is 16 cm.

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13. The dimensions of the model of a multistorey building are $1.2m \times 75cm \times 2m$. If the scale factor is 1 : 30, find the actual dimensions of the building.

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14. On a map drawn to a scale of 1 : 2,50,000, a triangular plot of land has the following measurements: $AB = 3cm$, $BC = 4cm$ and angle

$ABC = 90^\circ$ Calculate :

the actual lengths of AB and BC in km.

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15. On a map drawn to a scale of 1 : 2,50,000, a triangular plot of land has the following measurements: $AB = 3\text{cm}$, $BC = 4\text{cm}$ and angle $ABC = 90^\circ$ Calculate :

the area of the plot in sq. km.

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16. A model of a ship is made to a scale 1 : 300.

The length of the model of the ship is 2 m. Calculate the length of the ship.

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17. A model of a ship is made to a scale 1 : 300.

The area of the deck of the ship is $180,000m^2$. Calculate the area of the deck of the model.



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18. A model of a ship is made to a scale 1 : 300.

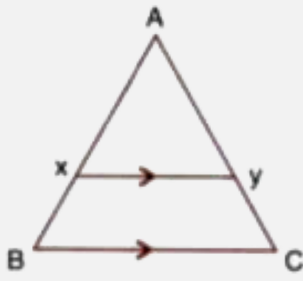
The volume of the model is $6.5m^3$. Calculate the volume of the ship.



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Exercise 15 E

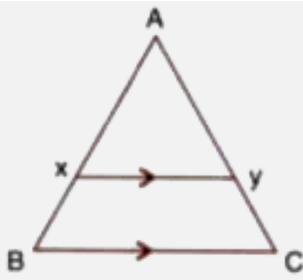
1. In the following figure, XY is parallel to BC , $AX = 9cm$, $XB = 4.5cm$ and $BC = 18cm$.



$$\frac{AY}{YC}$$

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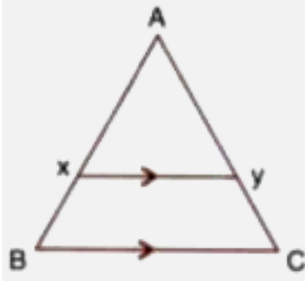
2. In the following figure, XY is parallel to BC , $AX = 9\text{cm}$, $XB = 4.5\text{cm}$ and $BC = 18\text{cm}$.



$$\frac{YC}{AC}$$

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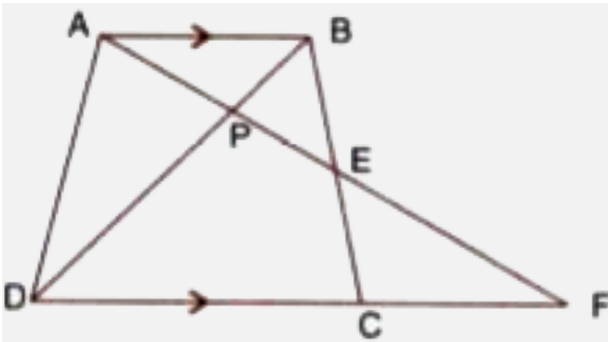
3. In the following figure, XY is parallel to BC , $AX = 9\text{cm}$, $XB = 4.5\text{cm}$ and $BC = 18\text{cm}$.



XY

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4. In the following figure, $ABCD$ is a trapezium with $AB \parallel DC$. If $AB = 9\text{cm}$, $DC = 18\text{cm}$, $CF = 13.5\text{cm}$, $AP = 6\text{cm}$ and $BE = 15\text{cm}$



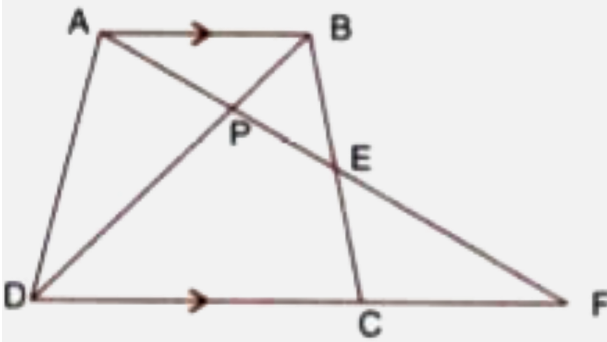
Calculate

EC



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5. In the following figure, ABCD to a trapezium with $AB \parallel DC$. If $AB = 9\text{cm}$, $DC = 18\text{cm}$, $CF = 13.5\text{cm}$, $AP = 6\text{cm}$ and $BE = 15\text{cm}$



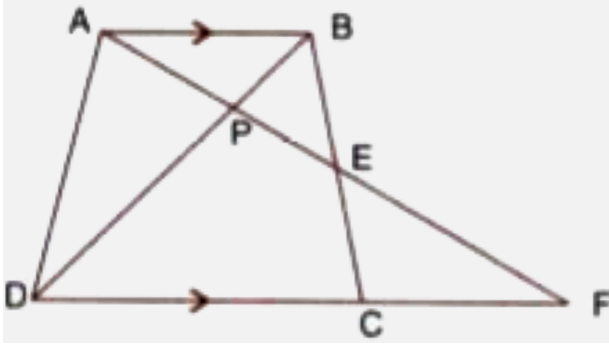
Calculate

AF



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6. In the following figure, ABCD to a trapezium with $AB \parallel DC$. If $AB = 9\text{cm}$, $DC = 18\text{cm}$, $CF = 13.5\text{cm}$, $AP = 6\text{cm}$ and $BE = 15\text{cm}$

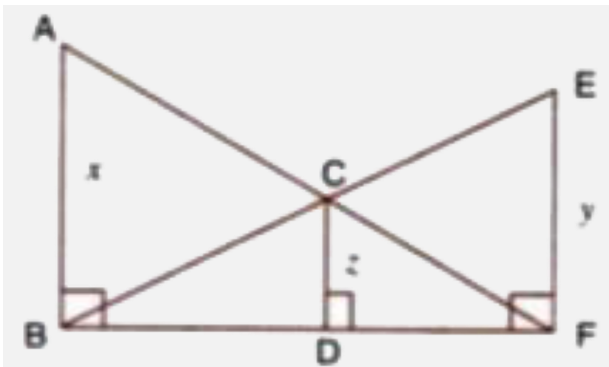


Calculate

PE

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7. In the following figure, AB , CD and EF are perpendicular to the straight line BDF .



If $AB = x$ and $CD = z$ unit and $EF = y$ unit, prove that :

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



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8. Triangle ABC is similar to triangle PQR. If AD and PM are corresponding medians of the two triangles, prove that : $\frac{AB}{PQ} = \frac{AD}{PM}$



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9. Triangle ABC is similar to triangle PQR. If AD and PM are altitudes of the two triangles, prove that : $\frac{AB}{PQ} = \frac{AD}{PM}$



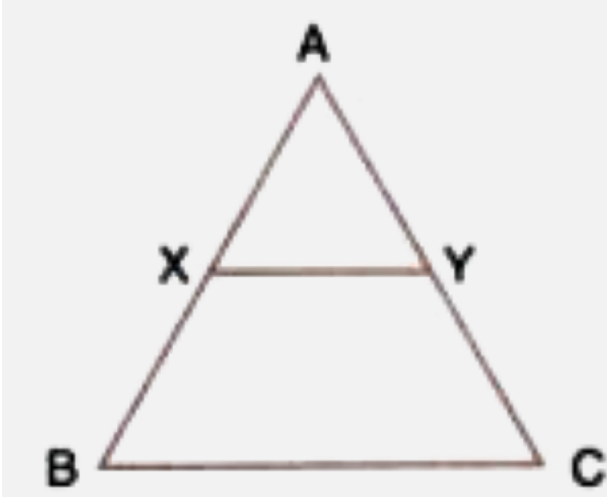
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10. Triangle ABC is similar to triangle PQR. If bisector of angle BAC meets BC at point D and bisector of angle QPR meets QR at point M, prove that : $\frac{AB}{PQ} = \frac{AD}{PM}$



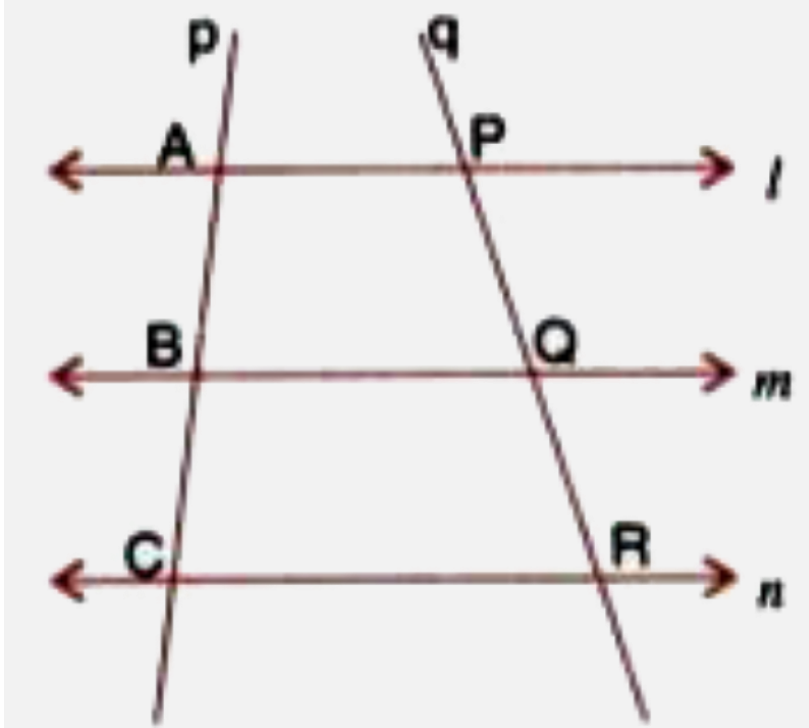
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11. In the following figure, $\angle AXY = \angle AYX$. . If $\frac{BX}{AX} = \frac{CY}{AY}$, show that triangle ABC is Isosceles.



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12. In the following diagram, lines l , m and n are parallel to each other. Two transversals p and q intersect the parallel lines at points A, B, C and P, Q, R as shown.

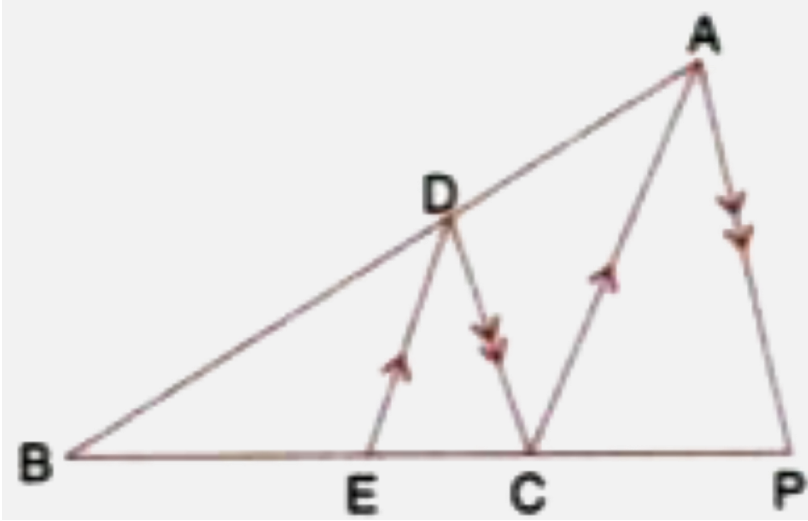


Prove that : $\frac{AB}{BC} = \frac{PQ}{QR}$

Join A and R. Let AR meets BQ at point D.

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13. In the following figure, $DE \parallel AC$ and $DC \parallel AP$. Prove that : $\frac{BE}{EC} = \frac{BC}{CP}$

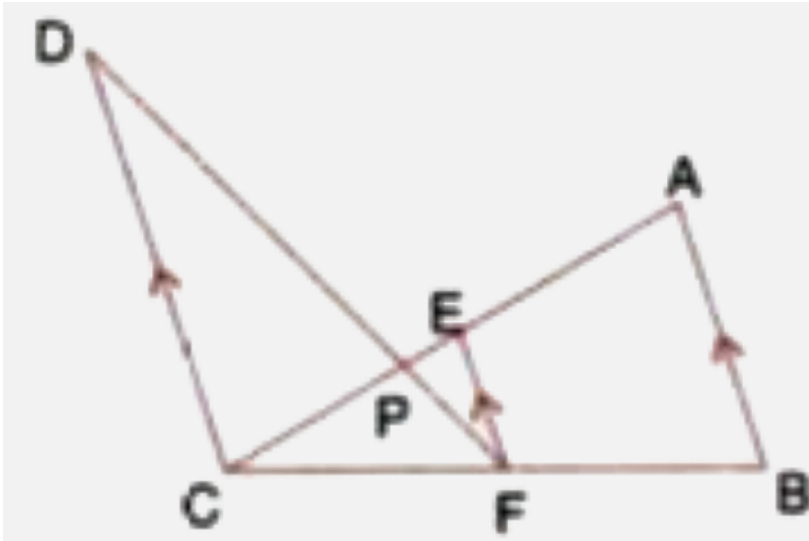


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14. In the figure given below, $AB \parallel EF \parallel CD$. If $AB = 22.5$ cm, $EP = 7.5$ cm, $PC = 15$ cm and $DC = 27$ cm.

Calculate :

EF



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15. In the figure given below, $AB \parallel EF \parallel CD$. If $AB = 22.5$ cm, $EP = 7.5$ cm, $PC = 15$ cm and $DC = 27$ cm.

Calculate :

AC



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16.

In

$\triangle ABC$, $\angle ABC = \angle DAC$, $AB = 8\text{cm}$, $AC = 4\text{cm}$ and $AD = 5\text{cm}$.



Prove that $\triangle ACD$ is similar to $\triangle BCA$.

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17.

In

$\triangle ABC$, $\angle ABC = \angle DAC$, $AB = 8\text{cm}$, $AC = 4\text{cm}$ and $AD = 5\text{cm}$.



Find BC and CD.

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18.

In

$\triangle ABC$, $\angle ABC = \angle DAC$, $AB = 8\text{cm}$, $AC = 4\text{cm}$ and $AD = 5\text{cm}$.



Find area of $\triangle ACD$: area of $\triangle ABC$.





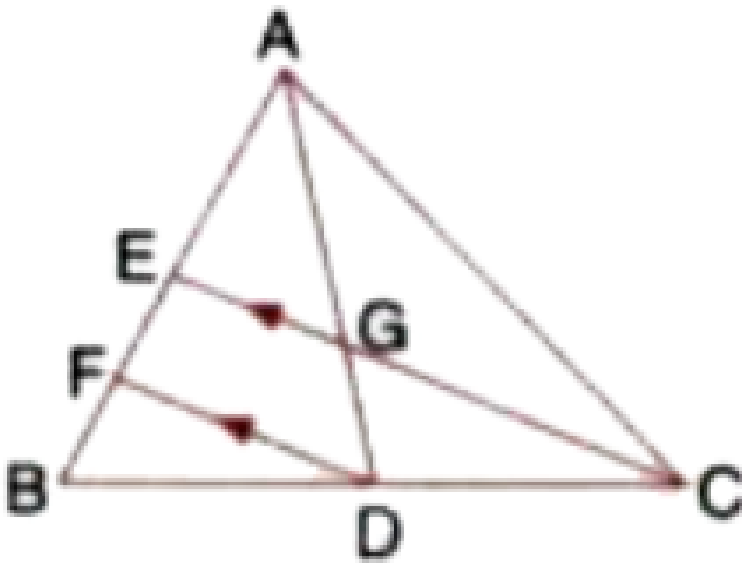
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19. In the given triangle P, Q and R are the mid points of sides AB, BC and AC respectively. Prove that triangle PQR is similar to triangle ABC.



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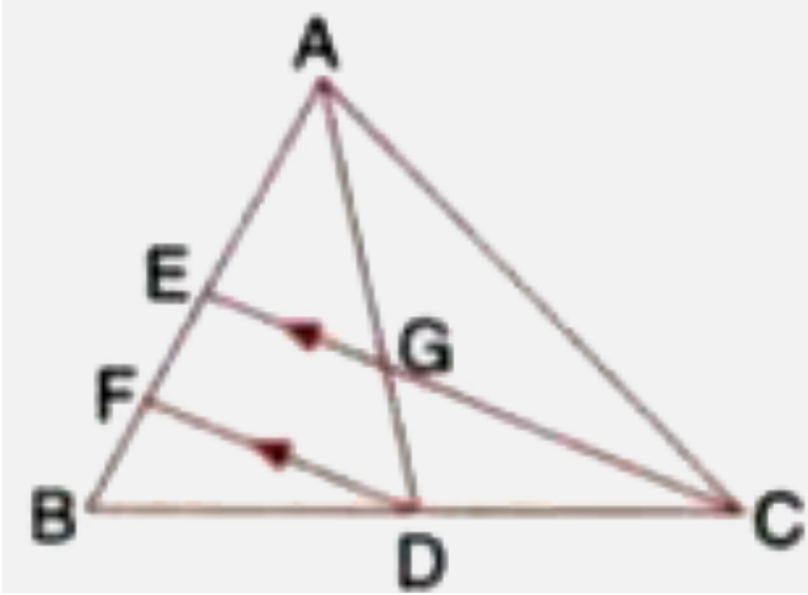
20. In the following figure, AD and CE are medians of $\triangle ABC$. DF is drawn parallel to CE. Prove that :



$$EF = FB$$

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21. In the following figure, AD and CE are medians of $\triangle ABC$. DF is drawn parallel to CE. Prove that :



$$AG:GD = 2:1.$$

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22. If the areas of two similar triangles are equal, prove that they are congruent.

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23. The ratio between the altitudes of two similar triangles is 3 : 5, write the ratio between their :

corresponding medians.



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24. The ratio between the altitudes of two similar triangles is $3 : 5$, write the ratio between their :
perimeters.



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25. The ratio between the altitudes of two similar triangles is $3 : 5$, write the ratio between their :
areas.



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26. The ratio between the areas of two similar triangles is $16 : 25$. Find the ratio between their :

perimeters.

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27. The ratio between the areas of two similar triangles is 16 : 25. Find the ratio between their :
corresponding altitudes.

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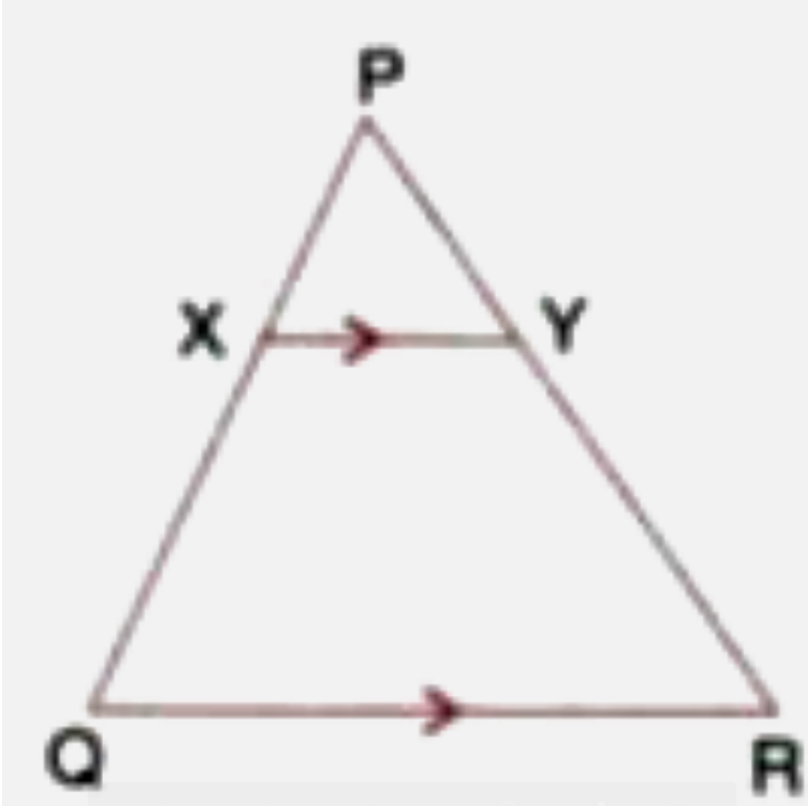
28. The ratio between the areas of two similar triangles is 16 : 25. Find the ratio between their :
corresponding medians.

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29. The given figure shows a triangle PQR in which XY is parallel to QR. If $PX : XQ = 1:3$ and $QR = 9$ cm, find the length of XY. Further, if the area of

$\Delta PXY = x\text{cm}^2$, find, in terms of x , the area of :

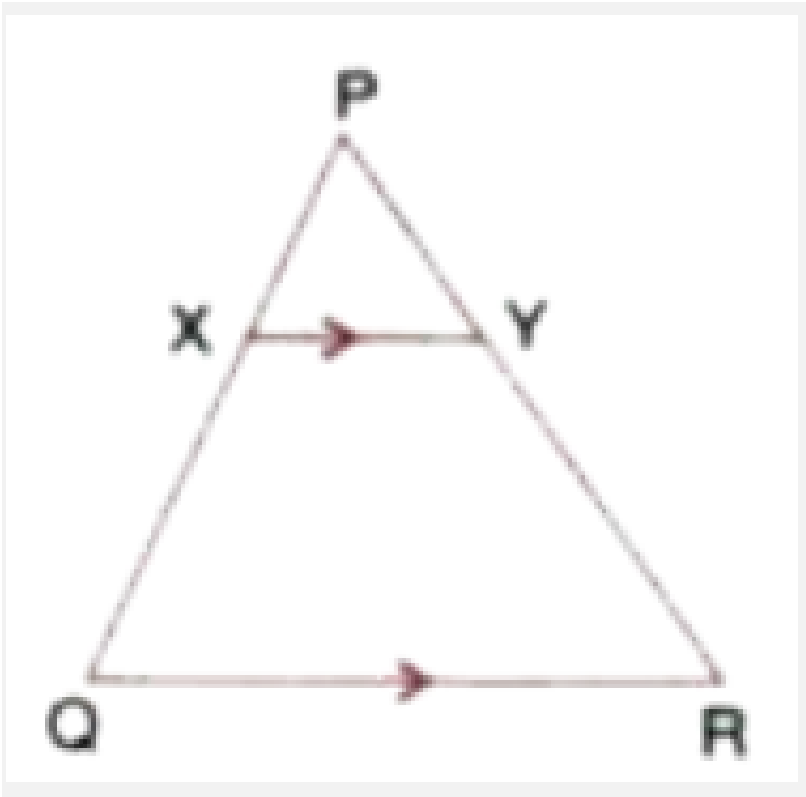
triangle PQR.



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30. The given figure shows a triangle PQR in which XY is parallel to QR. If $PX : XQ = 1:3$ and $QR = 9$ cm, find the length of XY. Further, if the area of $\Delta PXY = x\text{cm}^2$, find, in terms of x , the area of :

trapezium XQRY.



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31. On a map, drawn to a scale of 1 : 20000, a rectangular plot of land ABCD has $AB = 24\text{cm}$ and $BC = 32\text{cm}$. Calculate :
the diagonal distance of the plot in kilometre.

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32. On a map, drawn to a scale of 1 : 20000, a rectangular plot of land ABCD has $AB = 24\text{cm}$ and $BC = 32\text{cm}$. Calculate :
the area of the plot in sq. km.



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33. The dimensions of the model of a multi storeyed building are 1 m by 60 cm by 1.20 m. If the scale factor is 1 : 50, find the actual dimensions of the building. Also, find :
the floor area of a room of the building, if the floor area of the corresponding room in the model is 50 sq. cm.



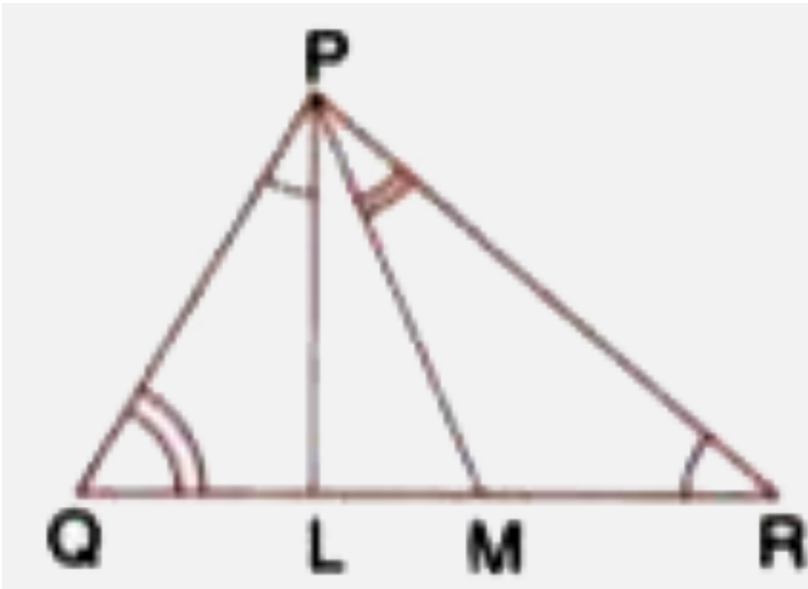
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34. The dimensions of the model of a multi storeyed building are 1 m by 60 cm by 1.20 m. If the scale factor is 1 : 50, find the actual dimensions of the building. Also, find :

the space (volume) inside a room of the model, if the space inside the corresponding room of the building is $90m^3$.

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35. In a triangle PQR , L and M are two points on the base QR , such that $\angle LPQ = \angle QRP$ and $\angle RPM = \angle RQP$. Prove that:



$\Delta PQL \sim \Delta RPM$

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36. In a triangle PQR , L and M are two points on the base QR , such that $\angle LPQ = \angle QRP$ and $\angle RPM = \angle RQP$. Prove that:

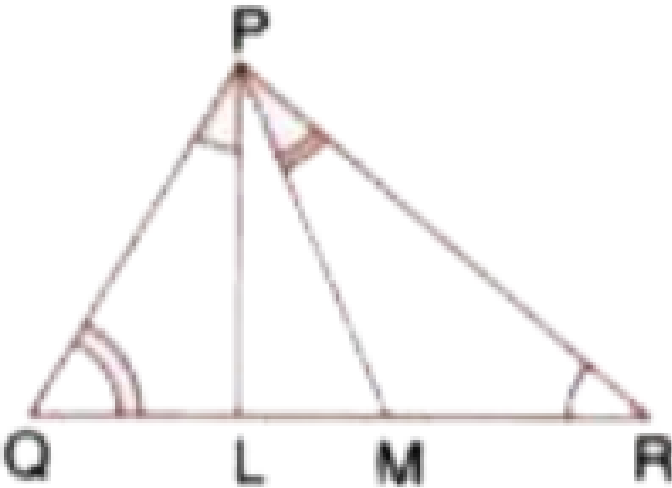


$$QL \times RM = PL \times PM$$



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37. In a triangle PQR , L and M are two points on the base QR , such that $\angle LPQ = \angle QRP$ and $\angle RPM = \angle RQP$. Prove that:



$$PQ^2 = QR \times QL$$



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38. A triangle ABC with $AB = 3\text{cm}$, $BC = 6\text{cm}$ and $AC = 4\text{cm}$ is enlarged to $ADEF$ such that the longest side of $ADEF = 9\text{cm}$. Find the scale factor and hence, the lengths of the other sides of $\triangle DEF$.



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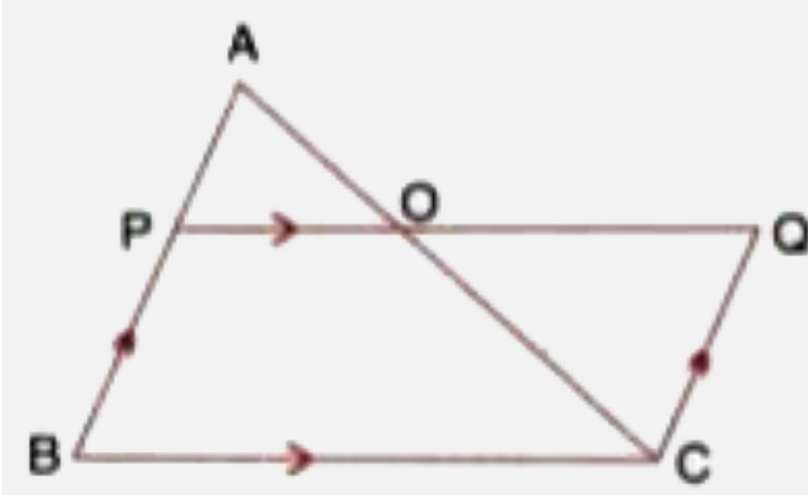
39. Two isosceles triangles have equal vertical angles. Show that the triangles are similar.

If the ratio between the areas of these two triangles is $16 : 25$, find the ratio between their corresponding altitudes.



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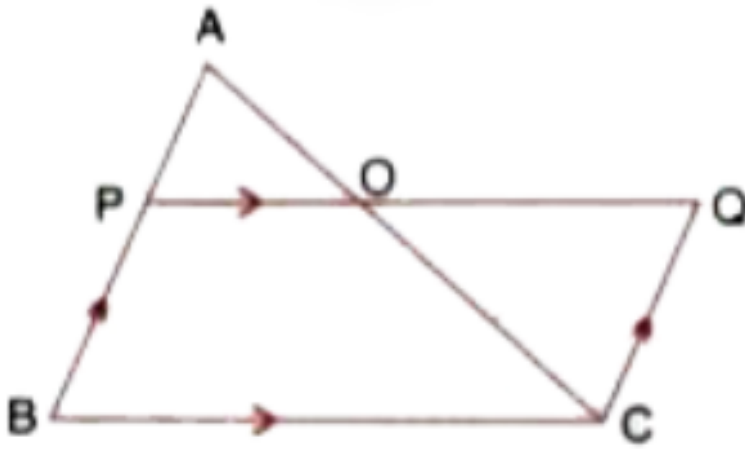
40. In triangle ABC , $AP:PB = 2:3$. PO is parallel to BC and is P extended to Q so that CQ is parallel to BA . Find :



area $\triangle APO$: area $\triangle ABC$.

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41. In triangle ABC , $AP:PB = 2:3$. PO is parallel to BC and is P extended to Q so that CQ is parallel to BA . Find :



area $\triangle APO$: area $\triangle CRO$.

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42. The following figure shows a triangle ABC in which AD and BE are perpendiculars to BC and AC respectively. Show that :

$$\triangle ADC \sim \triangle BEC$$



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43. The following figure shows a triangle ABC in which AD and BE are perpendiculars to BC and AC respectively. Show that :

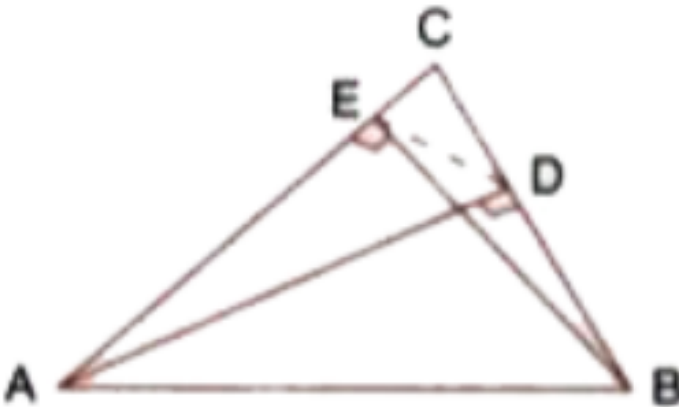
$$CA \times CE = CB \times CD$$



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44. The following figure shows a triangle ABC in which AD and BE are perpendiculars to BC and AC respectively. Show that :

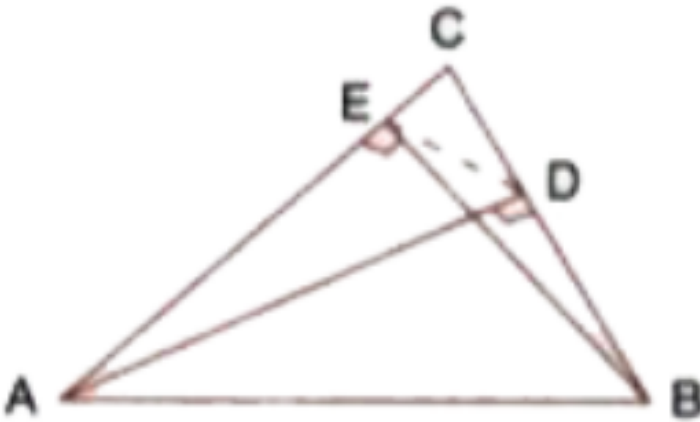
$$\Delta ABC \sim \Delta DEC$$



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45. The following figure shows a triangle ABC in which AD and BE are perpendiculars to BC and AC respectively. Show that :

$$CD \times AB = CA \times DE$$



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46. In the given figure, ABC is a triangle with $\angle EDB = \angle ACB$. Prove that $\triangle ABC \sim \triangle EBD$.

If $BE = 6\text{cm}$, $EC = 4\text{cm}$, $BD = 5\text{cm}$ and area of $\triangle BED = 9\text{cm}^2$.

Calculate the :



length of AB



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47. In the given figure, ABC is a triangle with $\angle EDB = \angle ACB$. Prove that $\Delta ABC \sim \Delta EBD$.

If $BE = 6\text{cm}$, $EC = 4\text{cm}$, $BD = 5\text{cm}$ and area of $\Delta BED = 9\text{cm}^2$.

Calculate the :

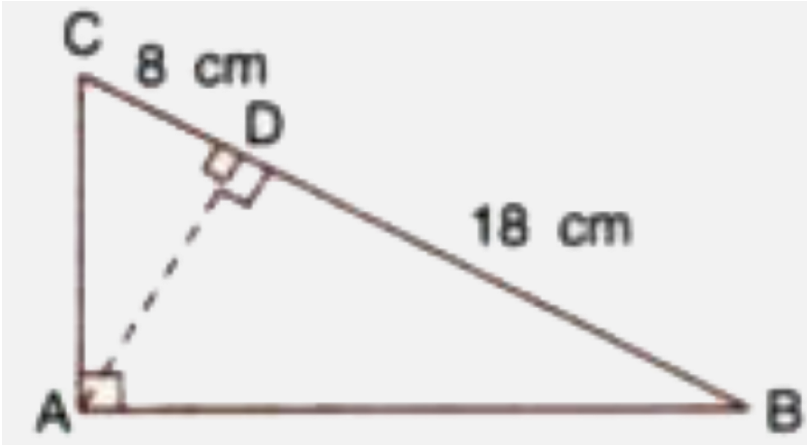


area of ΔABC



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48. In the given figure, ABC is a right angled triangle with $\angle BAC = 90^\circ$.



Prove that : $\triangle ADB \sim \triangle CDA$.

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49. In the given figure, ABC is a right angled triangle with $\angle BAC = 90^\circ$.



If $BD = 18$ cm and $CD = 8$ cm, find AD.

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50. In the given figure, ABC is a right angled triangle with $\angle BAC = 90^\circ$.

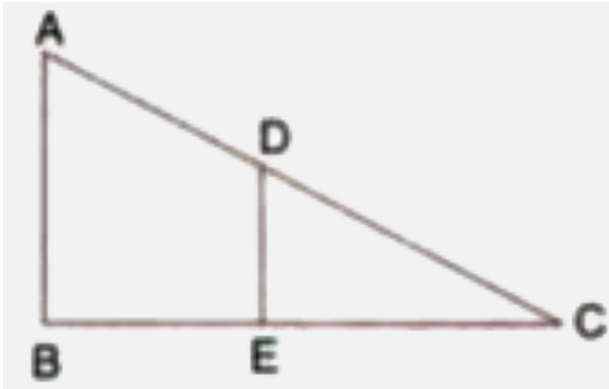


Find the ratio of the area of ΔADB is to area of ΔCDA .



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51. In the given figure, AB and DE are perpendiculars to BC

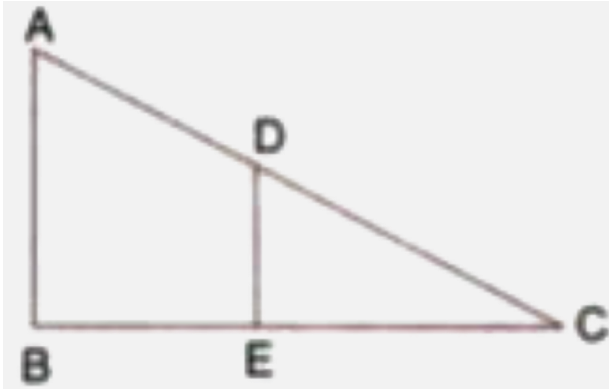


Prove that : $\Delta ABC \sim \Delta DEC$



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52. In the given figure, AB and DE are perpendiculars to BC



If $AB = 6$ cm, $DE = 4$ cm and $AC = 15$ cm. Calculate CD.

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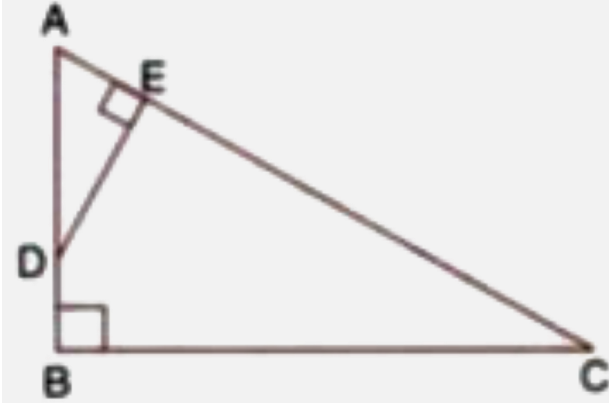
53. In the given figure, AB and DE are perpendiculars to BC



Find the ratio : area of a ΔABC : area of ΔDEC .

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54. ABC is a right angled triangle with $\angle ABC = 90^\circ$. D is any point on AB and DE is perpendicular to AC. Prove that:



$\triangle ADE \sim \triangle ACB$.

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55. ABC is a right angled triangle with $\angle ABC = 90^\circ$. D is any point on AB and DE is perpendicular to AC. Prove that:



If AC = 13 cm, BC = 5 cm and AE = 4 cm. Find DE and AD.

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56. ABC is a right angled triangle with $\angle C = 90^\circ$. D is any point on AB and DE is perpendicular to AC. Prove that:



Find, area of AADE: area of quadrilateral BCED.



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57. Given : $AB \parallel DE$ and $BC \parallel EF$. Prove that:

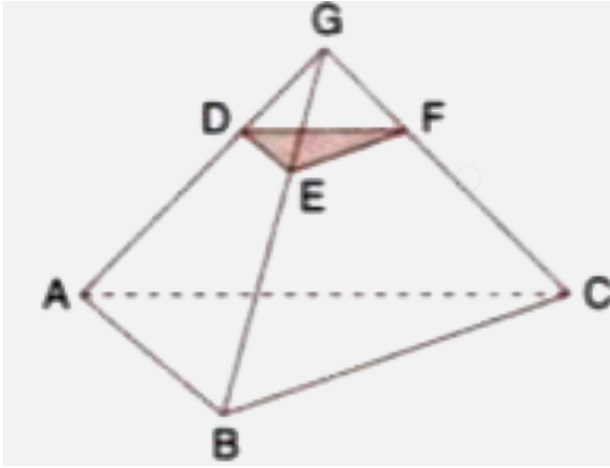


$$\frac{AD}{DG} = \frac{CF}{FG}$$



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58. Given : $AB \parallel DE$ and $BC \parallel EF$. Prove that:

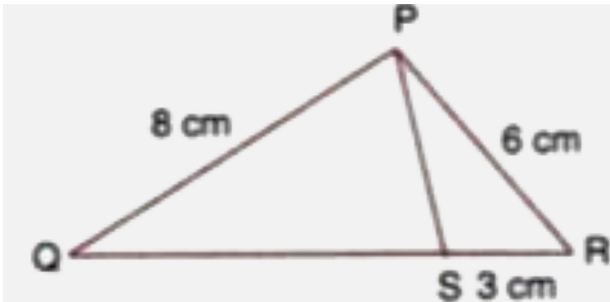


$\triangle DFG \sim \triangle ACG$.



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59. PQR is a triangle. S is a point on the side QR of $\triangle PQR$ such that $\angle PSR = \angle QPR$. Given $QP = 8$ cm, $PR = 6$ cm and $SR = 3$ cm.

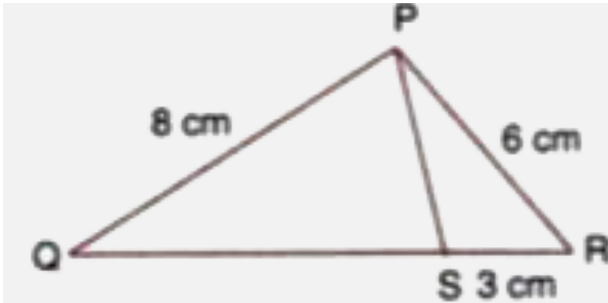


Prove $\triangle PQR \sim \triangle SPR$.



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60. PQR is a triangle. S is a point on the side QR of $\triangle PQR$ such that $\angle PSR = \angle QPR$. Given $QP = 8$ cm, $PR = 6$ cm and $SR = 3$ cm.

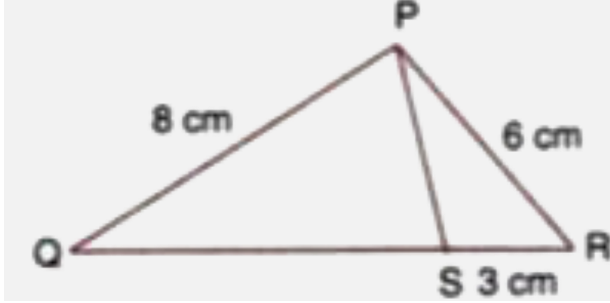


Find the lengths of QR and PS .



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61. PQR is a triangle. S is a point on the side QR of $\triangle PQR$ such that $\angle PSR = \angle QPR$. Given $QP = 8$ cm, $PR = 6$ cm and $SR = 3$ cm.

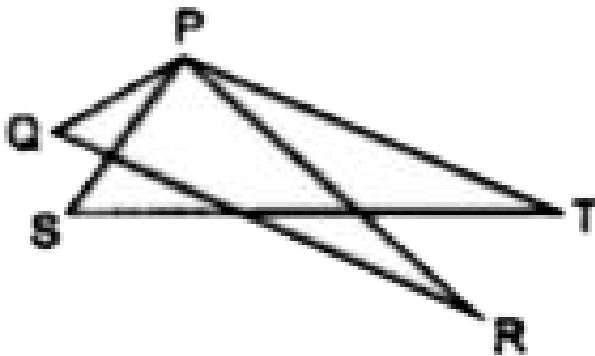


$$\frac{\text{area of } \triangle PQR}{\text{area of } \triangle SPR}$$

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Multiple Choice Questions

1. In the given if $\triangle PQR \sim \triangle PST$ and $PT : ST = 3 : 4$ then $QR : PR =$



A. 3 : 4

B. 4:3

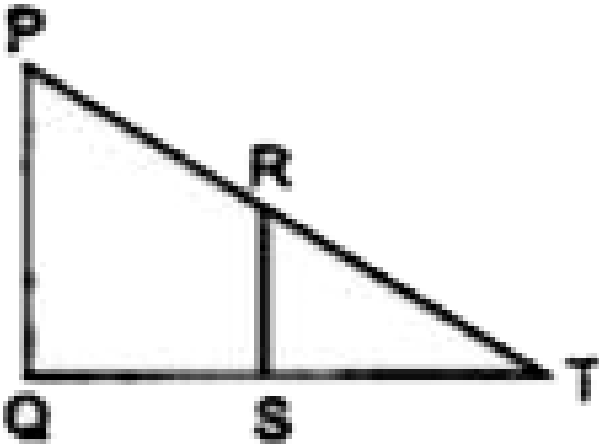
C. 3:7

D. 4:7

Answer: B

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2. In the PQ and RS are perpendicular to base QT . If $RS = 2$ cm, $QS = 3$ cm and $QT = 9$ cm, then $PQ =$



A. 2 cm

B. 3 cm

C. 4 cm

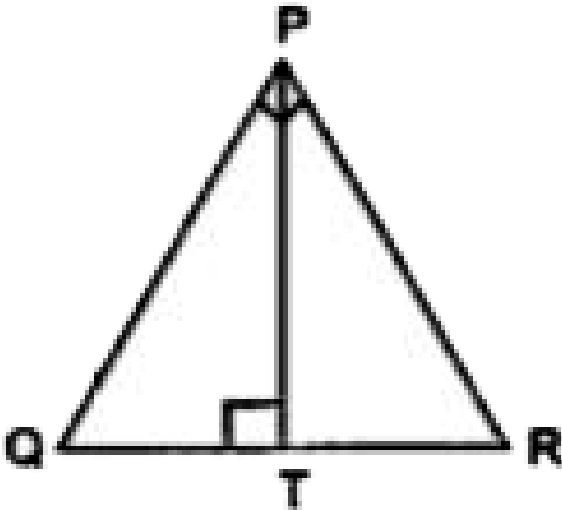
D. 5 cm

Answer: B



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3. In the $\triangle PRT$. If $QT = 4\text{cm}$ and $TR = 9\text{cm}$ then $PT =$



A. 5 cm

B. 6 cm

C. 13 cm

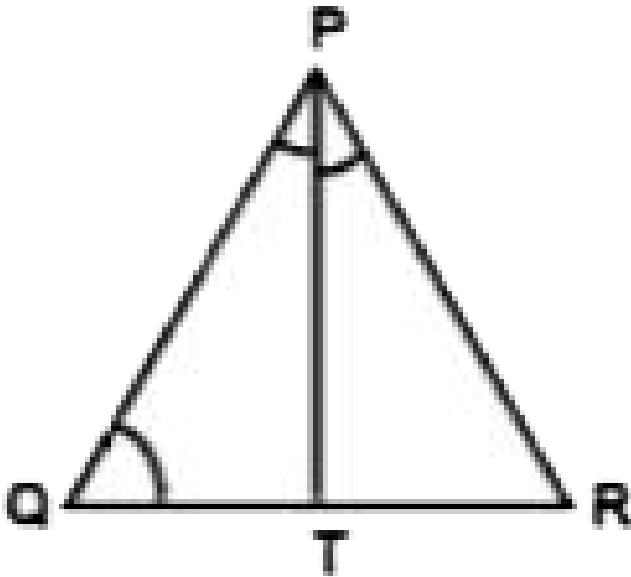
D. 36 cm

Answer: B



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4. In the $\Delta PQT - \Delta RPT$ by which of the following similarity criterion ?



A. SAS

B. ASA

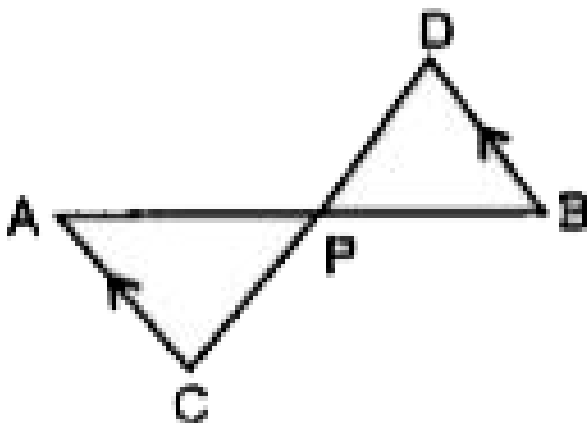
C. AA

D. SSS

Answer: C

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5. In the given $\triangle BPD \sim \triangle BPC$ by which of the following similarity criterion ?



A. SAS

B. SSS

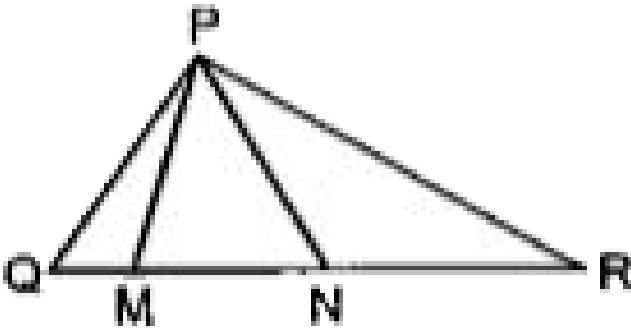
C. ASA

D. AA

Answer: D

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6. In the given if $PM = PN$ and $PM^2 = QM \times NR$, then which of the following is true ?



A. $\triangle PQM \sim \triangle RPN$

B. $\triangle PQM \sim \triangle PRN$

C. $\triangle PQM \sim \triangle PNR$

D. $\triangle PQM \sim \triangle NRP$

Answer: A



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7. If in a trapezium PQRS, $PQ \parallel SR$ and diagonals PR and QS intersect each other at a point O, then which of the following is true ?

A. $\triangle POQ \sim \triangle SOR$

B. $\triangle POQ \sim \triangle ROS$

C. $\triangle PQO \sim \triangle OSR$

D. $\triangle OQP \sim \triangle ROS$

Answer: B



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8. In a $\triangle ABC$, $BM \perp AC$ and $CN \perp AB$. If $AB = 3\text{ cm}$, $AC = 4\text{ cm}$ and $AM = 2\text{ cm}$, then $AN =$

- A. 2 cm
- B. 4 cm
- C. 6 cm
- D. 8 cm

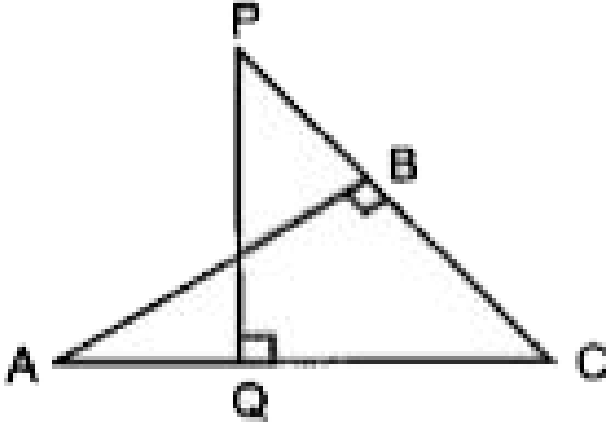
Answer: A



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9. In the given figure, $\angle OQC = \angle ABC = 90^\circ$. If $AC = 8\text{ cm}$, $PC = 12\text{ cm}$, $QC = x + 1$ and $BQ = 2x - 1$, then find the value of x .

then find the value of x :



A. 1

B. $\frac{5}{4}$

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

D. 2

Answer: B



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10. In a ΔPQR , $\perp QR$ such that $\Delta PQT \sim \Delta RQP$. Then $\angle QPR =$

A. 30°

B. 45°

C. 60°

D. 90°

Answer: D



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11.

In

ΔPQR , $\angle Q = 90^\circ$ and $QT \perp PR$. If $PR = 9\text{cm}$ and $PQ = 3\text{cm}$,

then $PT =$

A. 1 cm

B. 2 cm

C. 3 cm

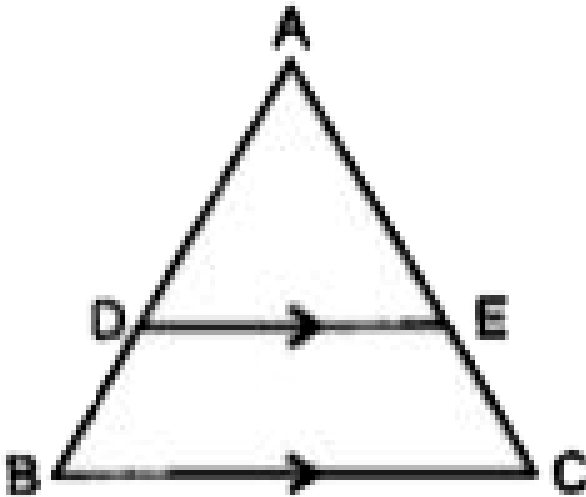
D. 4 cm

Answer: A



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12. In the given $DE \parallel BC$ and $AD:AB = 1:3$ If $DE:1.5$ cm, then $BC =$



A. 1 cm

B. 2 cm

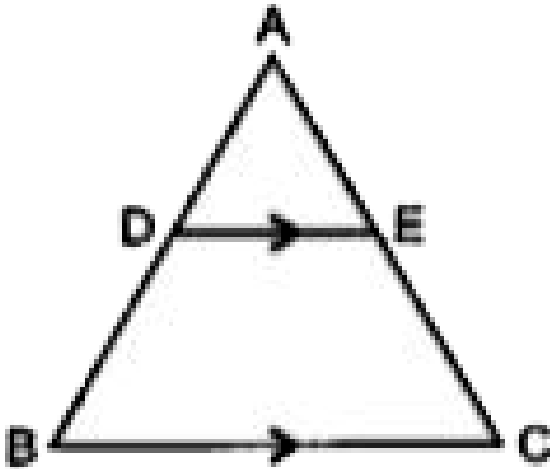
C. 3 cm

D. 4.5cm

Answer: D

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13. In the given $DE \parallel BC$. If $AB = 6$ cm, $AD = 2$ cm and $AC = 9$ cm, then the length of CE is :



- A. 3 cm
- B. 6 cm
- C. 9 cm
- D. 12 cm

Answer: B



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14. In a ΔABC , M and N are points on the base BC such that $\angle MAB = \angle BCA$ and $\angle CAN = \angle ABC$. If $AM = 2$ cm, $BM = 3$ cm and $AN = 6$ cm then $NC =$

A. 8 cm

B. 6 cm

C. 4 cm

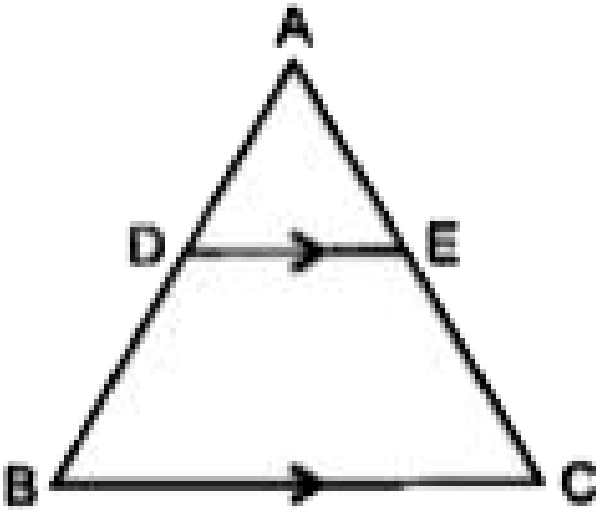
D. 2 cm

Answer: C



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15. In a $\triangle ABC$, $DE \parallel BC$. If $AD:DB = 3:4$. Then $DE:BC =$



A. 3:4

B. 4:3

C. 3:7

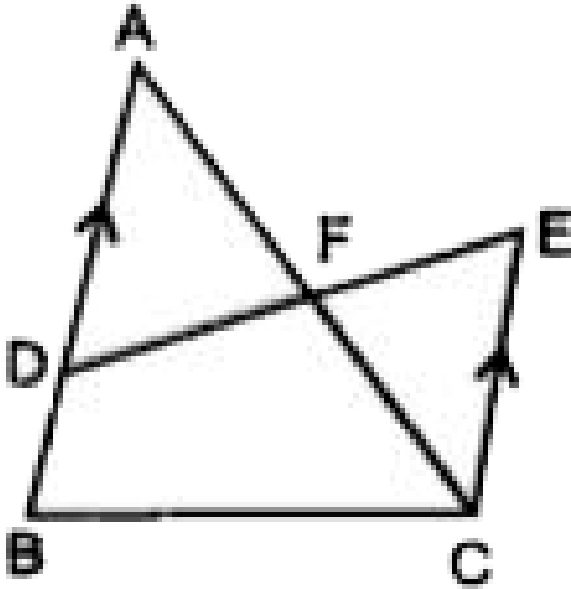
D. 4:7

Answer: B



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16. In the following which of the two triangles are similar ?



A. $\triangle ADF \sim \triangle CEF$

B. $\triangle ABC \sim \triangle CEF$

C. $\triangle ADF \sim \triangle ABC$

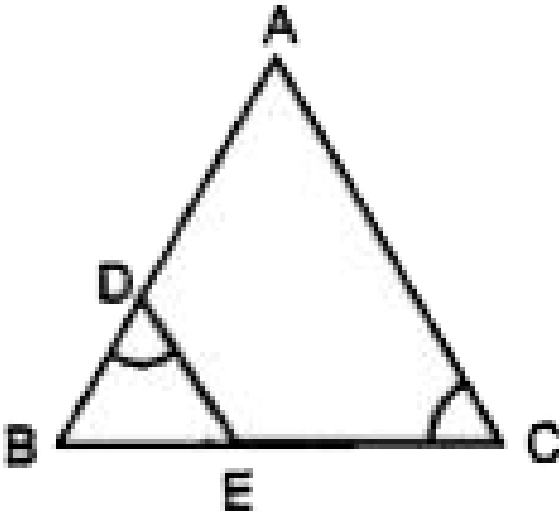
D. None of these

Answer: B



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17. In the following $\angle EDB = \angle ACB$. If $BE = 6$ cm, $EC = 1$ cm and $BD = 7$ cm, then the length of AB is



A. $\frac{30}{7}$ cm

B. $\frac{36}{7}$ cm

C. 6 cm

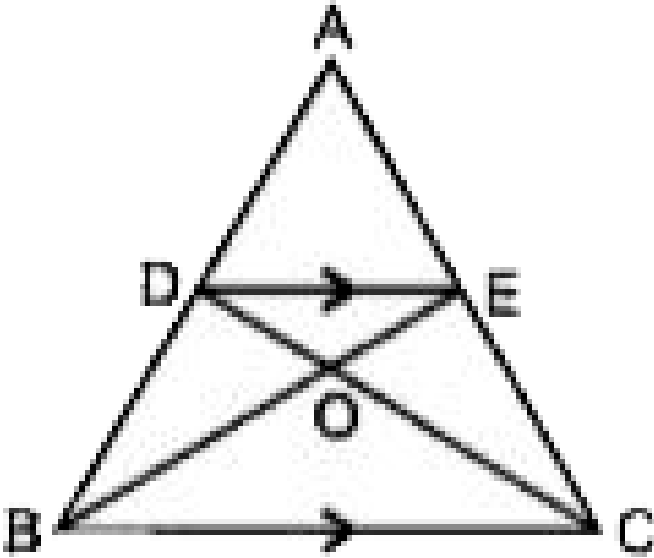
D. 7 cm

Answer: C



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18. In the given $DE \parallel BC$ and DC and BE intersect each other at point O . If $DE : BC = 5 : 9$, then $OD : DC =$

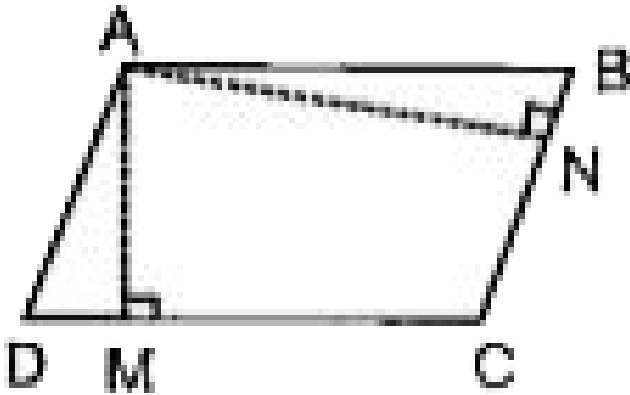


- A. 5 : 9
- B. 5 : 4
- C. 4 : 9
- D. 5 : 14

Answer: D

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19. In the given ABCD is a parallelogram. If $AM \perp DC$ and $AN \perp CB$, $AM = 6\text{cm}$, $AN = 10\text{cm}$ and $AB = 12\text{cm}$, then $BC =$



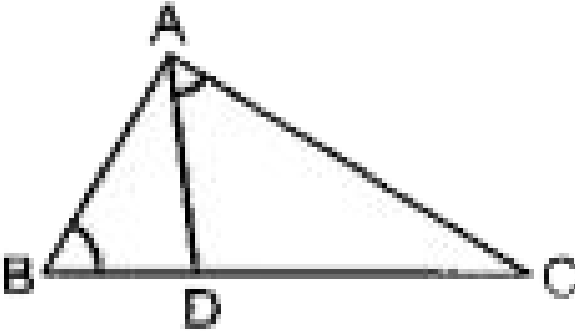
- A. 5 cm
- B. 6 cm
- C. 7.2cm
- D. 20 cm

Answer: C



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20. In following the D is any point on base BC such that $\angle ABD = \angle CAD$. If $AD = 10\text{cm}$, $AB = 5\text{cm}$ and $AC = 7\text{cm}$, then $BC =$



A. 3.5cm

B. 5 cm

C. 7 cm

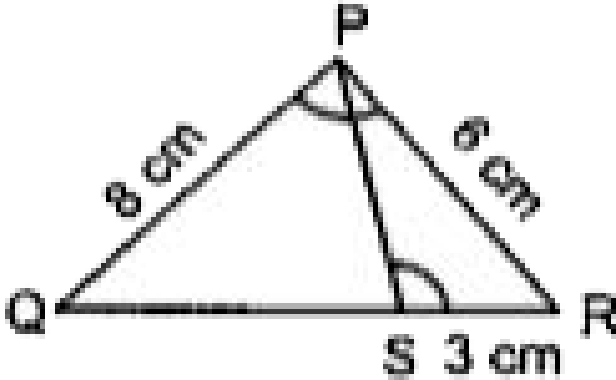
D. 14 cm

Answer: A



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21. PQR is a triangle . S is a point on the QR of $\triangle PQR$ such that $\angle PSR = \angle QPR$. Given $QP = 8$ cm, $PR = 6$ cm and $SR = 3$ cm , then length of QR is



- A. 12 cm
- B. 10 cm
- C. 8 cm
- D. 6 cm

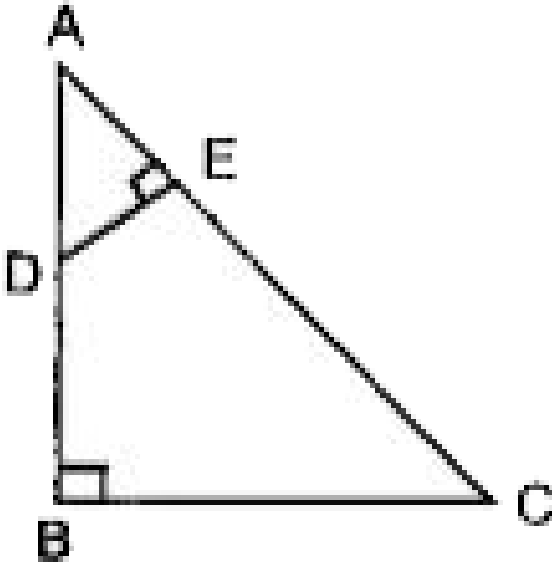
Answer: A



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22. In the given $\triangle ABC$ is right angled at B. If $DE \perp AC$, then $\triangle ADE$

.....



A. $\triangle BAC$

B. $\triangle ACB$

C. $\triangle ADE$

D. $\triangle ABC$

Answer: B



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23. In a $\triangle ABC$, D is a point on base BC such that $\angle ABC = \angle DAC$.

Then $\triangle ACD$

A. $\triangle ABC$

B. $\triangle BCA$

C. $\triangle DAC$

D. $\triangle CAD$

Answer: B



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24. In a $\triangle ABC$, D is a point on base BC such that $\triangle ACD \sim \triangle BCA$. If $AB = 5$ cm, $AC = 4$ cm and $AD = 8$ cm, then $BC =$

A. 5 cm

B. 4 cm

C. 2.5cm

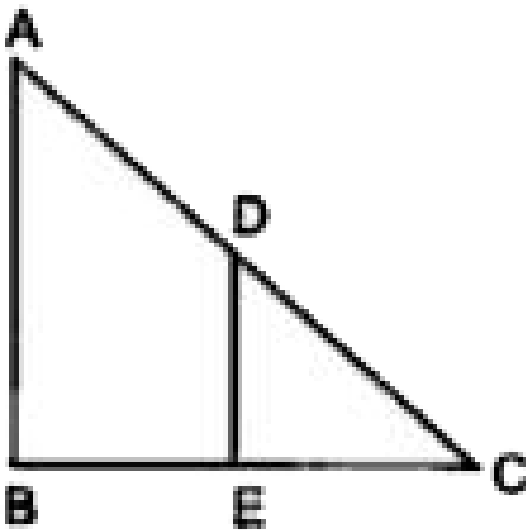
D. 8 cm

Answer: D



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25. In the $\triangle ABC \sim \triangle DEC$. If $AB = 6\text{cm}$, $DE = 3\text{cm}$ and $AC = 15\text{cm}$, then CD =



A. 3 cm

B. 6 cm

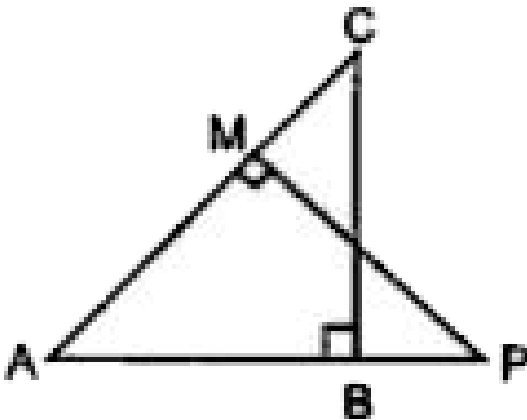
C. 1.5cm

D. 2.5cm

Answer: D

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26. In the given $\triangle ABC \sim \triangle AMP$ by similarity criterion.



A. SSS

B. SAS

C. ASA

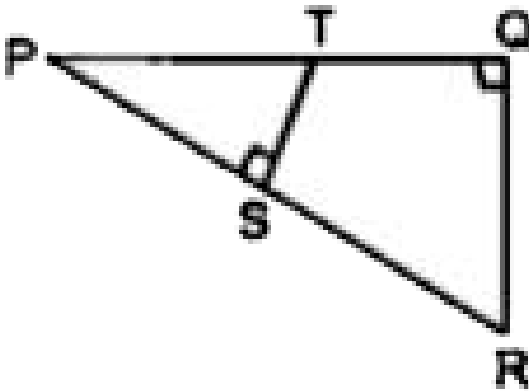
D. AA

Answer: D



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27. In the given if $\Delta PQR \sim \Delta PST$, then $\frac{PQ}{PR} = \dots\dots\dots$



A. $\frac{PS}{PR}$

B. $\frac{PT}{PS}$

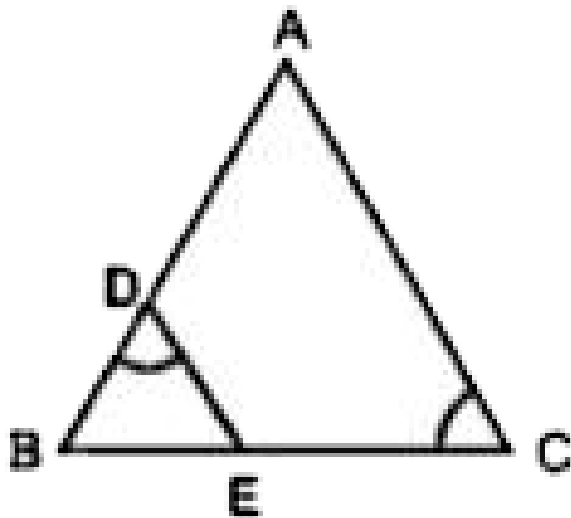
C. $\frac{PR}{PQ}$

D. $\frac{PR}{PQ}$

Answer: B

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28. In the $\angle EDB = \angle ACB$. For $\triangle ABC \sim \triangle EBD$, we must have $\angle ABC = \dots\dots\dots$



A. $\angle EBD$

B. $\angle ADE$

C. $\angle CBE$

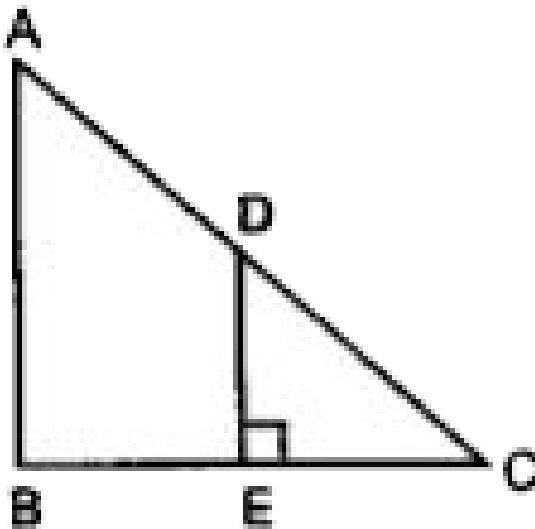
D. $\angle ACE$

Answer: A



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29. In the given $\triangle ABC \sim \triangle DEF$ if $\angle ABC = \dots\dots\dots$ and $\angle BCA = \dots\dots\dots$



A. $\angle ACD, \angle ADE$

B. $\angle DEC, \angle ECD$

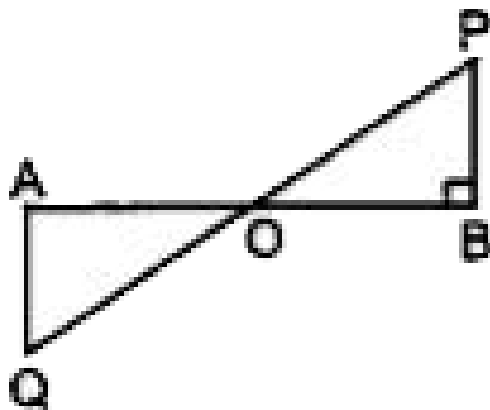
C. $\angle DCE, \angle EDC$

D. $\angle ADE, \angle ACB$

Answer: B

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30. In the given PB and QA are perpendicular to the line segment AB. If $PQ = 6$ cm, $QO = 9$ cm, $PB = 4$ cm, then $AQ = \dots\dots\dots$



A. 6 cm

B. 9 cm

C. 4 cm

D. 3 cm

Answer: A

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Multiple Choice Questions Assertion And Reason Based Questions

1. Assertion : If in two triangles ABC and PQR, $\Delta ABC \sim \Delta PQR$ with $\angle A = 45^\circ$ and $\angle B = 60^\circ$, then $\angle R = 75^\circ$.

Reason : If two triangles are similar, then their corresponding angles are equal.

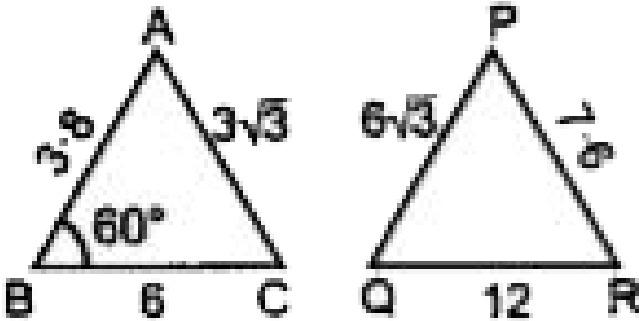
- A. Both assertion and reason are correct and reason is the correct explanation of assertion.
- B. Both assertion and reason are correct but reason is not the correct explanation of assertion.
- C. Assertion is correct but reason is incorrect.

D. Assertion is incorrect but reason is correct.

Answer: A

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2. Assertion : In the following the measure of $\angle P$ is 60° .



Reason : Two triangles are said to be similar, if their corresponding sides are proportional i.e., they are in the same ratio.

- A. Both assertion and reason are correct and reason is the correct explanation of assertion.
- B. Both assertion and reason are correct but reason is not the correct explanation of assertion.

C. Assertion is correct but reason is incorrect.

D. Assertion is incorrect but reason is correct.

Answer: D



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3. Assertion : If in two triangle ABC and PQR , $AB = 3cm$, $BC = 4cm$, $\angle B = 60^\circ$, $\angle PQR = 90^\circ$ and $PR = 12cm$, then $\Delta ABC \sim \Delta PQR$.

Reason : If one angle of a triangles is equal to one angle of another triangle and any two sides of these triangles are proportional, then by SAS axiom of similarity, the two triangles are proportional.

A. Both assertion and reason are correct and reason is the correct explanation of assertion.

B. Both assertion and reason are correct but reason is not the correct explanation of assertion.

C. Assertion is correct but reason is incorrect.

D. Assertion is incorrect but reason is correct.

Answer: C



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4. Assertion : In a $\triangle DAC$. If $AB = 8\text{cm}$, $AC = 5\text{cm}$ and $AD = 4\text{cm}$, then $BC = 10\text{cm}$.

Reason : If two triangles are similar, then their corresponding angles are equal.

A. Both assertion and reason are correct and reason is the correct explanation of assertion.

B. Both assertion and reason are correct but reason is not the correct explanation of assertion.

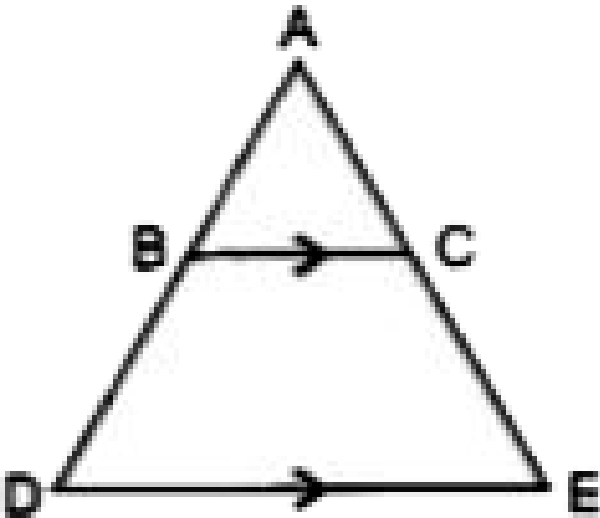
C. Assertion is correct but reason is incorrect.

D. Assertion is incorrect but reason is correct.

Answer: B

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5. Assertion : In the following BC is parallel to DE. If $AB = x$, $BD = x + 3$, $BC = x - 1$ and $DE = 2x$, then the value of x is 3.



Reason : Corresponding angles of two similar triangles are equal.

A. Both assertion and reason are correct and reason is the correct explanation of assertion.

B. Both assertion and reason are correct but reason is not the correct explanation of assertion.

C. Assertion is correct but reason is incorrect.

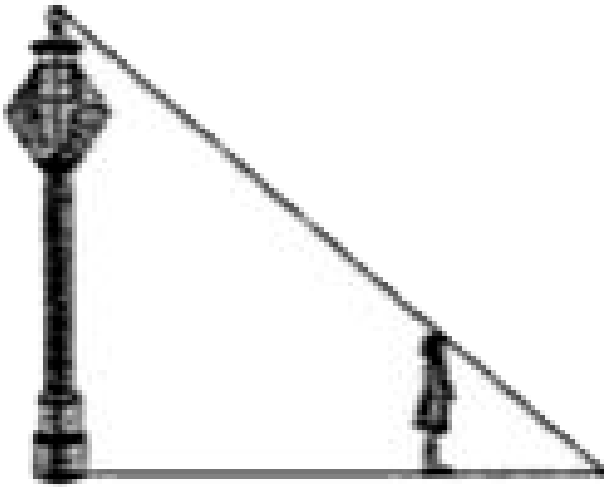
D. Assertion is incorrect but reason is correct.

Answer: B

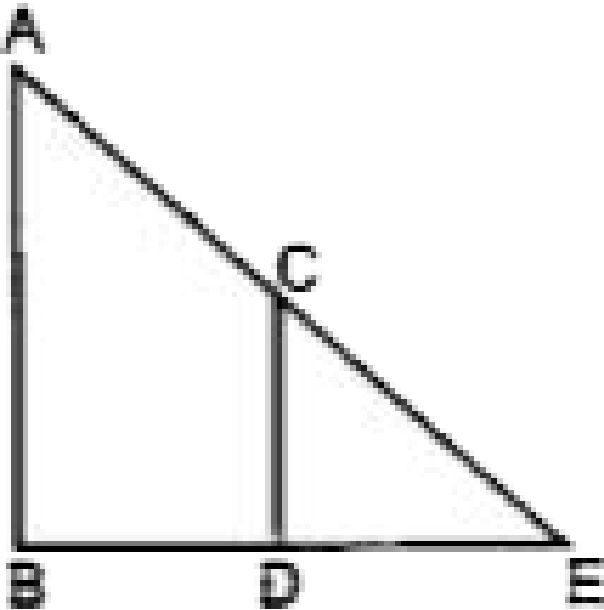
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Multiple Choice Questions Competency Based Questions

1. A girl, named Ritika of height 90 cm is walking away from the base of a lamp-post, She observes the shadows of lamp-post and herself and relate it with a chapter of mathematics, she studied in her last class.



On the basis of information, answer the following question



The triangles ABE and CDE are similar by which of the following similarity rule ?

A. AA

B. ASA

C. SSS

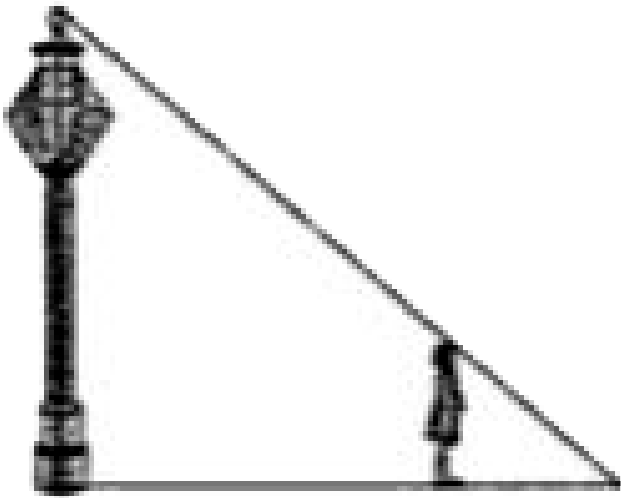
D. SAS

Answer: A

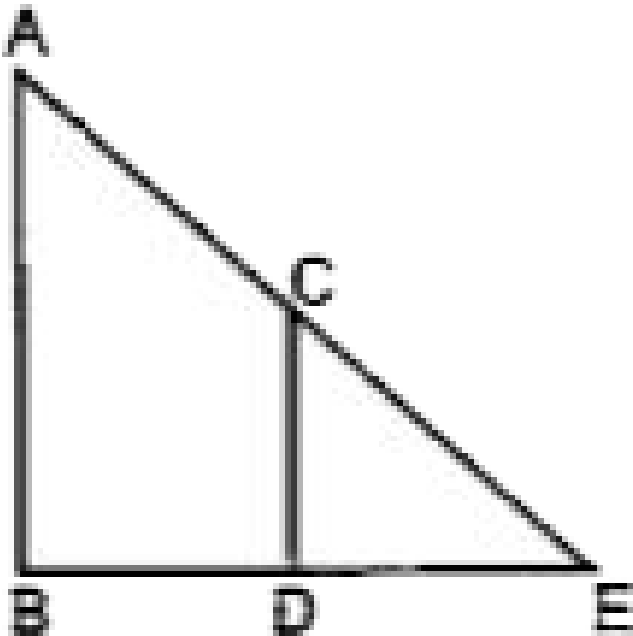


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2. A girl, named Ritika of height 90 cm is walking away from the base of a lamp-post, She observes the shadows of lamp-post and herself and relate it with a chapter of mathematics, she studied in her last class.



On the basis of information, answer the following question



If $DE = 120$ cm and $BE = 360$ cm , then length of the lamp-post is :

A. 150 cm

B. 240 cm

C. 270 cm

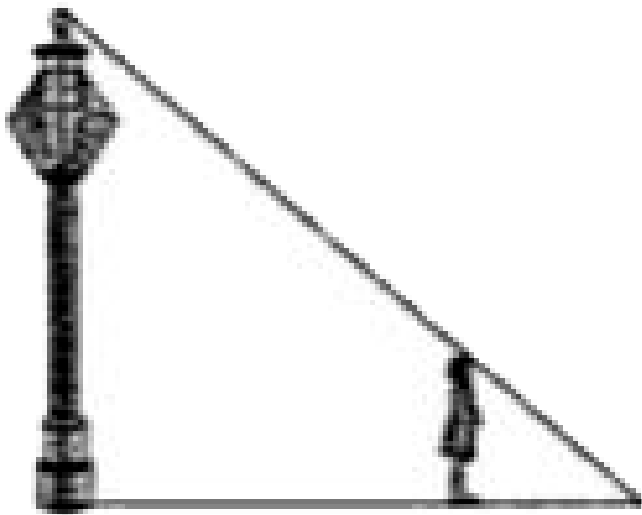
D. 360 cm

Answer: C

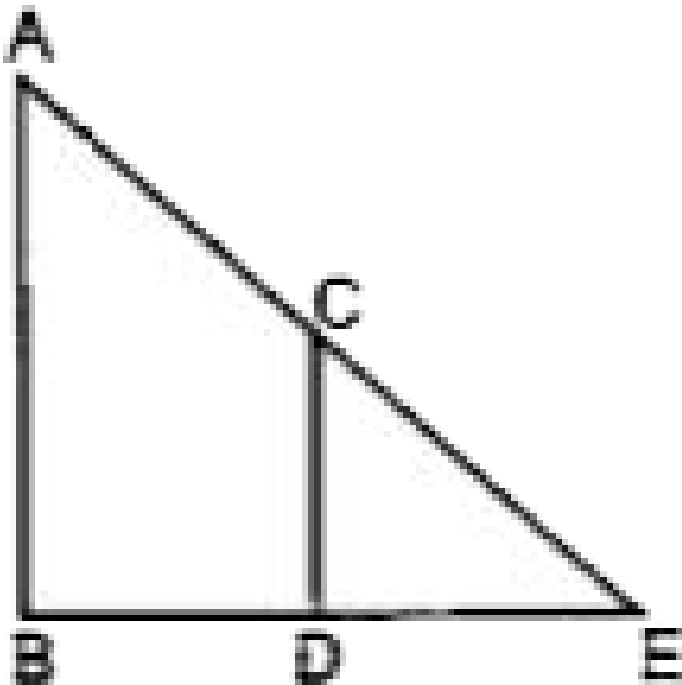


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3. A girl, named Ritika of height 90 cm is walking away from the base of a lamp-post, She observes the shadows of lamp-post and herself and relate it with a chapter of mathematics, she studied in her last class.



On the basis of information, answer the following question



The ratio of heights of girl and the lamp-post is :

A. 4:1

B. 1:4

C. 3:1

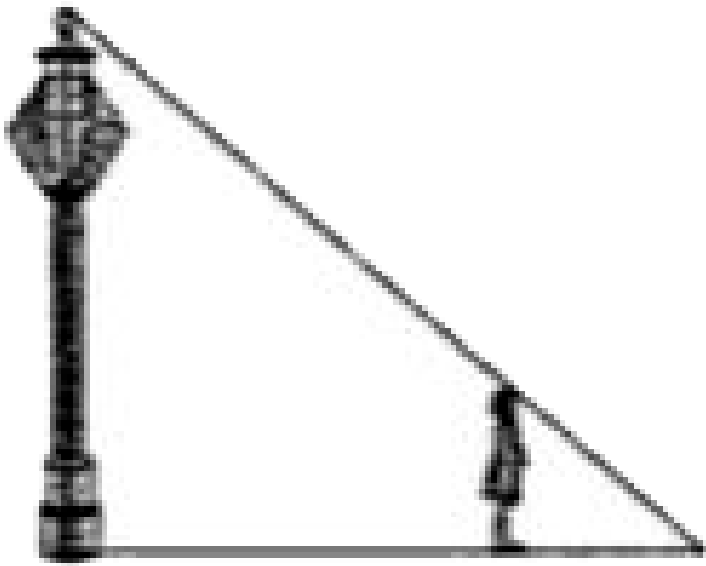
D. 1:3

Answer: D

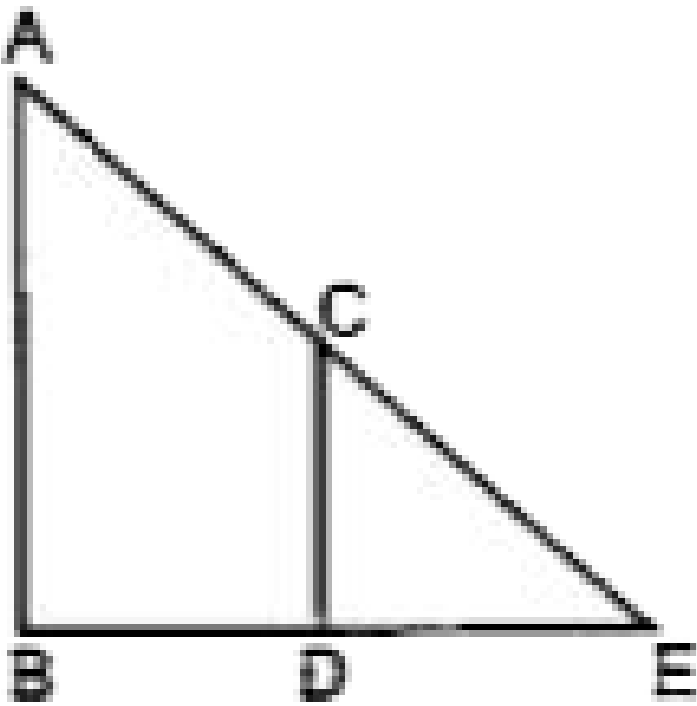


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4. A girl, named Ritika of height 90 cm is walking away from the base of a lamp-post, She observes the shadows of lamp-post and herself and relate it with a chapter of mathematics, she studied in her last class.



On the basis of information, answer the following question



If $CE = 150$ cm, then $AC =$

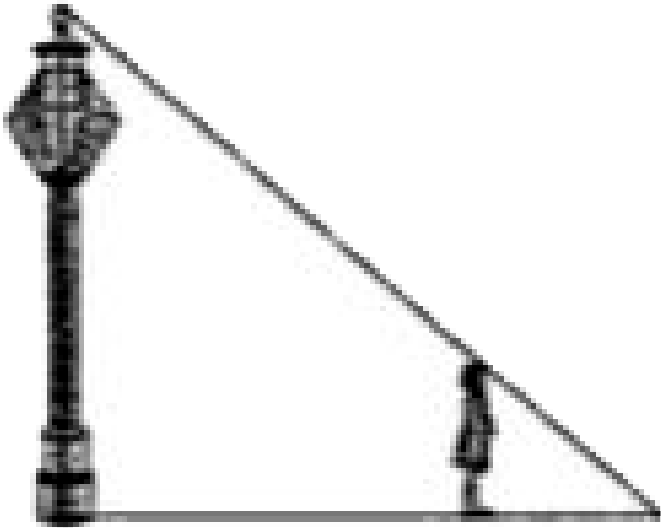
- A. 300 cm
- B. 200 cm
- C. 150 cm
- D. 100 cm

Answer: A

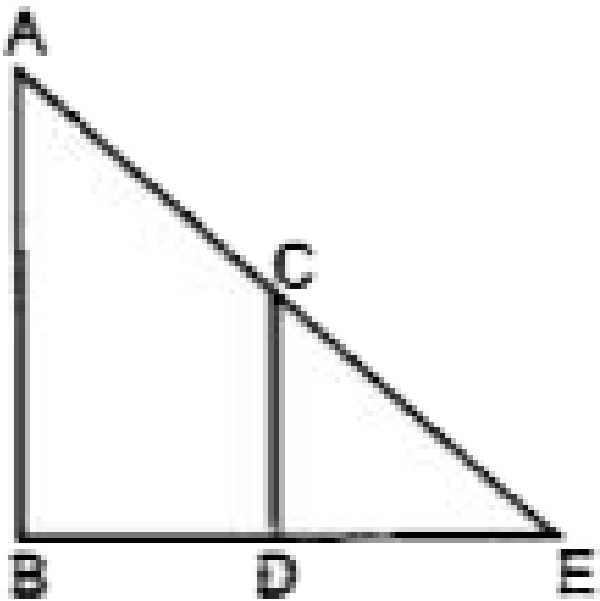


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5. A girl, named Ritika of height 90 cm is walking away from the base of a lamp-post, She observes the shadows of lamp-post and herself and relate it with a chapter of mathematics, she studied in her last class.



On the basis of information, answer the following question



Since $\triangle ABC \sim \triangle CDE$, then which of the following is correct ?

A. $CD \times AB = DE \times BD$

B. $CD \times BD = AB \times DE$

C. $CD \times CE = AB \times AE$

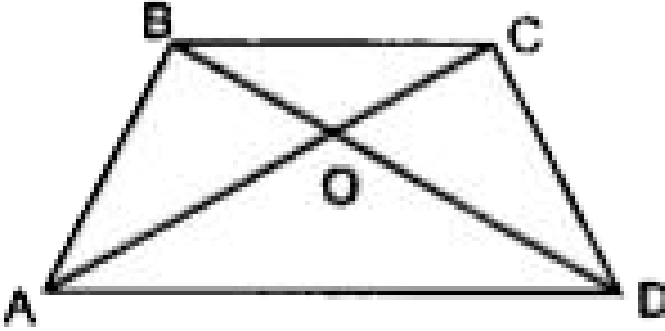
D. $CD \times AE = AB \times CE$

Answer: D



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6. Amit went on a trip to Uttarakhand, India. While driving, he observes a bridge in the shape of a trapezium. Let AC and BD be the diagonals of the bridge, which intersect each other at a point O.



Which of the following statement is correct regarding to similarity of triangles ?

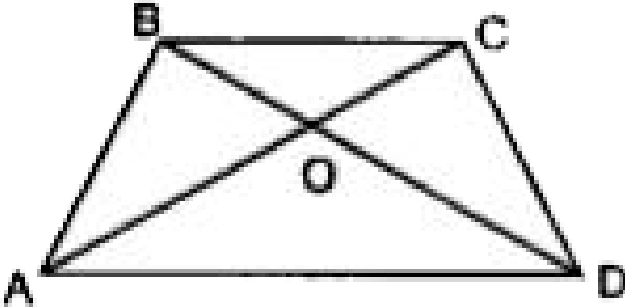
- A. $\triangle AOD \sim \triangle COB$ by SAS similarity rule
- B. $\triangle AOB \sim \triangle COD$ by SAS similarity rule
- C. $\triangle AOD \sim \triangle COB$ by AA similarity rule
- D. $\triangle AOB \sim \triangle COD$ by AA similarity rule

Answer: C



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7. Amit went on a trip to Uttarakhand, India. While driving, he observes a bridge in the shape of a trapezium. Let AC and BD be the diagonals of the bridge, which intersect each other at a point O .



If $AD = 15\text{cm}$, $OC = 3\text{cm}$, $OA = 5\text{cm}$, then the length of BC is.

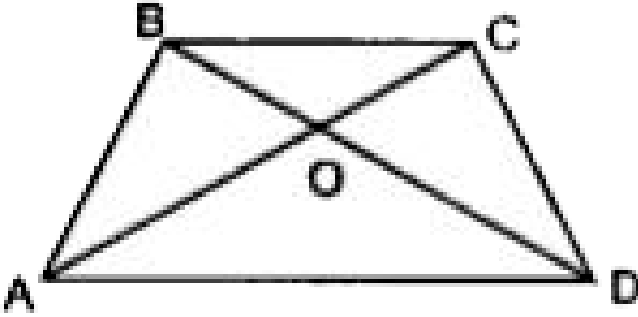
- A. 3 cm
- B. 9 cm
- C. 15 cm
- D. 20 cm

Answer: B



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8. Amit went on a trip to Uttarakhand, India. While driving, he observes a bridge in the shape of a trapezium. Let AC and BD be the diagonals of the bridge, which intersect each other at a point O.



If $OA = 3x - 1$, $OB = 6x - 5$, $OC = 5x - 3$ and $OD = 2x + 1$, then the value of x is :

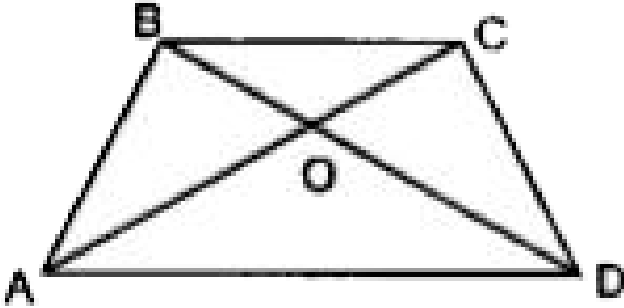
- A. 1
- B. 2
- C. 4
- D. 6

Answer: B



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9. Amit went on a trip to Uttarakhand, India. While driving, he observes a bridge in the shape of a trapezium. Let AC and BD be the diagonals of the bridge, which intersect each other at a point O .



If $OA = 2\text{cm}$, $OC = 3\text{cm}$ and $OD = 4\text{cm}$, then $OB =$

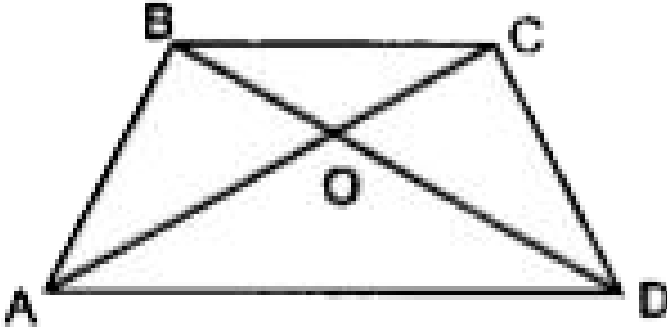
- A. 2 cm
- B. 4 cm
- C. 6 cm
- D. 8 cm

Answer: C



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10. Amit went on a trip to Uttarakhand, India. While driving, he observes a bridge in the shape of a trapezium. Let AC and BD be the diagonals of the bridge, which intersect each other at a point O.



One of the angle property used, if any, in proving the similarity triangles in part (A), is:

- A. Corresponding angles property of parallel lines
- B. Alternate angles property of parallel lines
- C. Interior angles property of parallel lines
- D. None of the above

Answer: B



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