



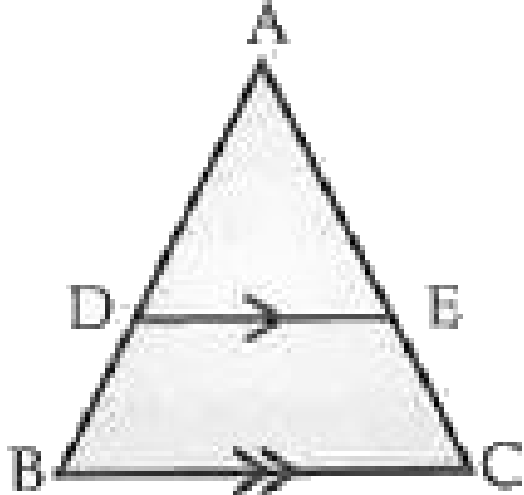
## MATHS

# BOOKS - OSWAAL PUBLICATION MATHS (KANNADA ENGLISH)

## TRIANGLES

### Topic 1 Basic Proportionality Theorem Multiple Choice Questions

1. In the adjoining figure, D and E are the mid-points of AB and AC respectively. If  $DE = 4cm$ , then BC is equal to :

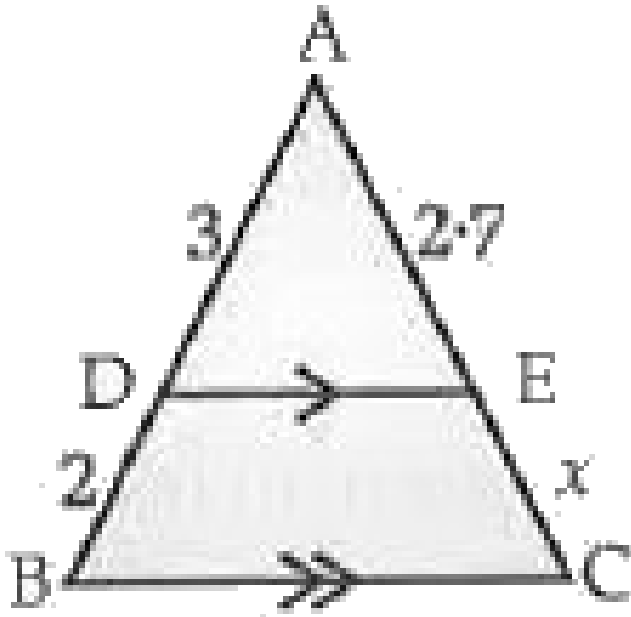


- A. 4 cm
- B. 6 cm
- C. 8 cm
- D. 12 cm

**Answer: C**

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2. In  $\triangle ABC$ ,  $DE \parallel BC$ , If  $AD = 3\text{cm}$ ,  $BD = 2\text{cm}$  and  $AE = 2.7$ , then  $AC$  is equal to :

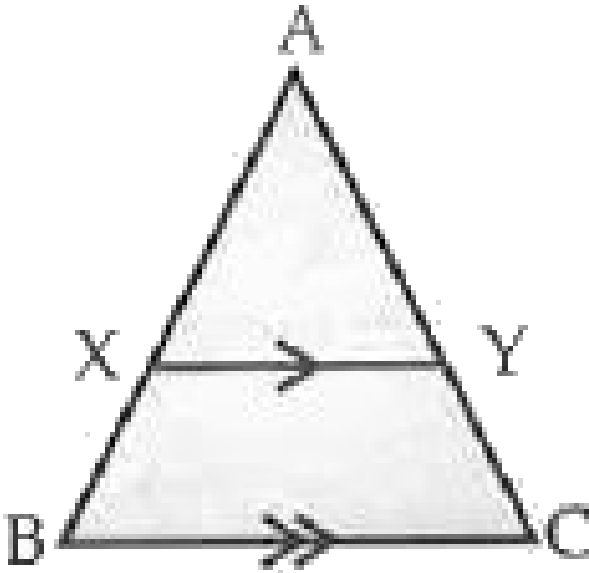


- A.  $6.5\text{cm}$
- B.  $4.5\text{cm}$
- C.  $3.5\text{cm}$
- D.  $5.5\text{cm}$

Answer: B

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3. In the adjoining figure,  $XY \parallel BC$ , then  $\frac{AX}{AB}$  is equal to :



A.  $\frac{AX}{AY}$

B.  $\frac{AX}{XB}$

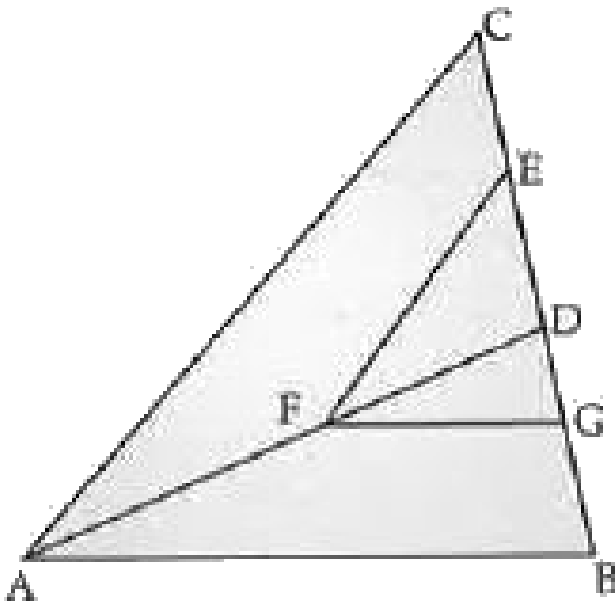
C.  $\frac{AY}{AC}$

D.  $\frac{AC}{AY}$

Answer: C

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4. In the given figure,  $EF \parallel CA$  and  $FG \parallel AB$  then  $\frac{DE}{EC}$  is equal to :



A.  $\frac{DG}{GB}$

B.  $\frac{GB}{DG}$

C.  $\frac{AF}{DF}$

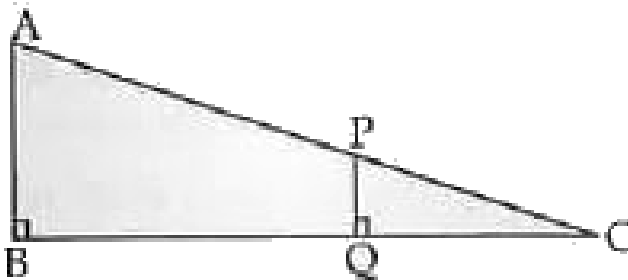
D.  $\frac{AB}{AD}$

Answer: A



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5. In the given figure,  $AB \parallel PQ$ . If  $PQ = 1.5\text{cm}$ ,  $QC = 2\text{cm}$  and  $RQ = 8\text{cm}$ , then measure of  $AB$ 's :



A. 10 cm

B.  $7.5\text{cm}$

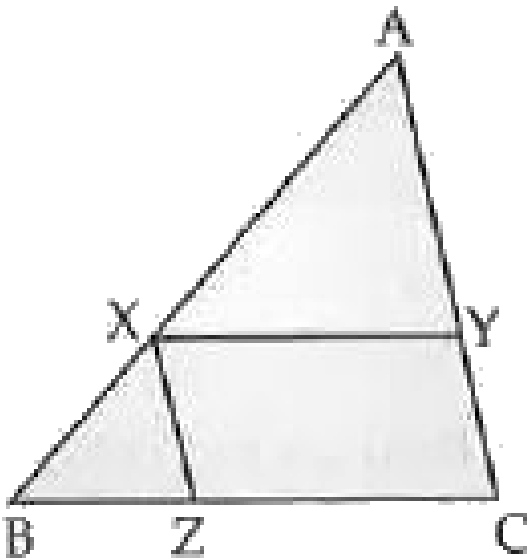
C.  $9.5\text{cm}$

D.  $3.5\text{cm}$

**Answer: B**

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6. In the given figure,  $XY \parallel BC$  and  $XZ \parallel AC$  then  $\frac{AX}{AB}$  is equal to :



A.  $\frac{XZ}{AB}$

B.  $\frac{XY}{AC}$

C.  $\frac{CZ}{BC}$

D.  $\frac{BZ}{BC}$

**Answer: C**

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7. ABCD is a trapezium in which  $AB \parallel DC$  and its diagonals intersect each other at the point O. Show that  $\frac{AO}{BO} = \frac{CO}{DO}$

A.  $\frac{OB}{OA}$

B.  $\frac{AB}{CD}$

C.  $\frac{OC}{OD}$

D.  $\frac{AC}{BD}$



**Answer: A**



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8. In  $\triangle ABC$ , D and E are the mid-points of AB and AC respectively, then the area of  $\triangle ADE$  is :

A.  $4\triangle ABC$

B.  $\frac{1}{4}\triangle ABC$

C.  $2\triangle ABC$

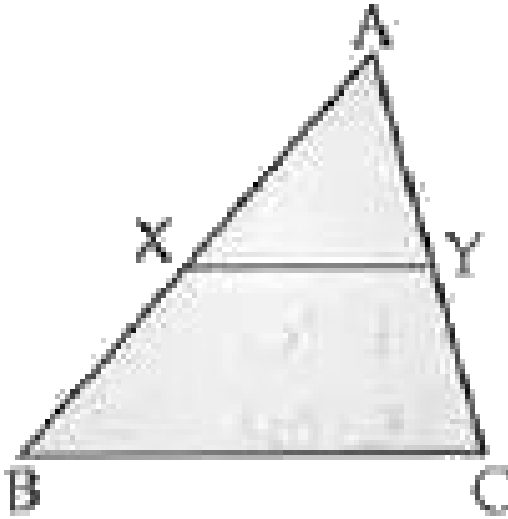
D.  $\frac{1}{2}\triangle ABC$

**Answer: B**



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9. In the given figure,  $XY \parallel BC$ , then  $\frac{AX}{BX}$



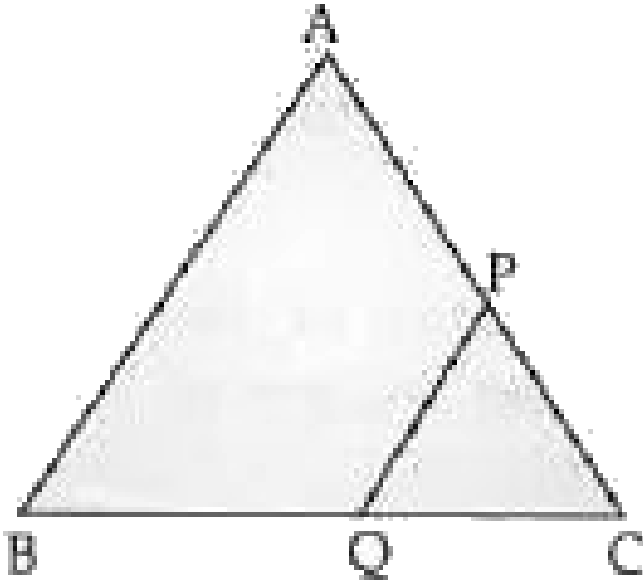
- A.  $\frac{AY}{AC}$
- B.  $\frac{YC}{AY}$
- C.  $\frac{AX}{AB}$
- D.  $\frac{AY}{CY}$

**Answer: D**



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10. In  $\triangle ABC$ ,  $PQ \parallel AB$ . The correct relation is :



A.  $\frac{BQ}{BA} = \frac{CP}{CA}$

B.  $\frac{AP}{PC} = \frac{BQ}{QC}$

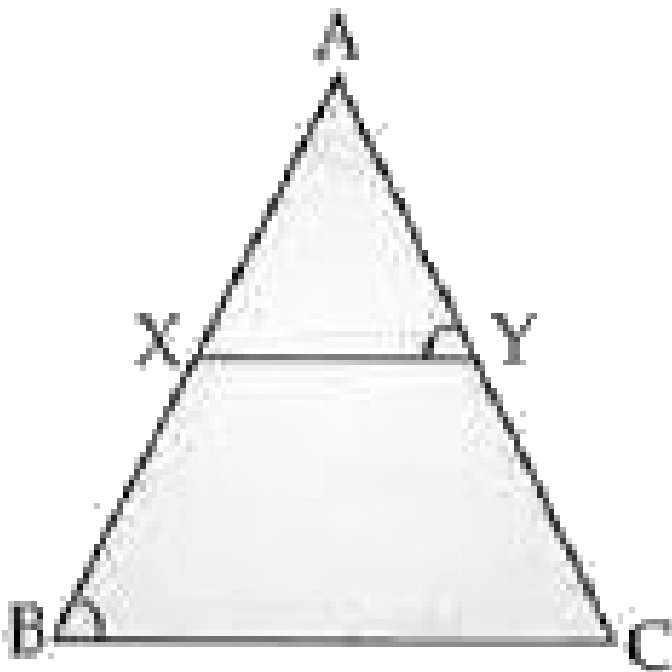
C.  $\frac{PQ}{BQ} = \frac{AB}{BC}$

D.  $\frac{PQ}{QC} = \frac{AB}{AP}$

**Answer: B**



11. In the given figure  $\angle ABC = \angle AYX$ , then the ratio of the corresponding sides is :



A.  $\frac{AX}{AC} = \frac{AB}{AY} = \frac{CB}{XY}$

B.  $\frac{AB}{AY} = \frac{BC}{XY} = \frac{AX}{AC}$

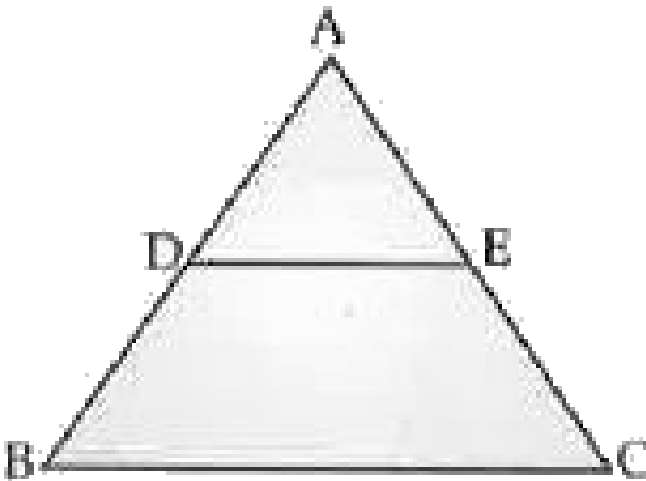
C.  $\frac{AB}{AX} = \frac{AC}{AY} = \frac{BC}{XY}$

$$D. \frac{AX}{AC} = \frac{AY}{AB} = \frac{XY}{CB}$$

Answer: D

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12. In the figure,  $DE \parallel BC$ ,  $AD:AB = 1:2$ ,  $BC = 6\text{cm}$ , then  $DE$  is :



A. 1 cm

B. 2 cm

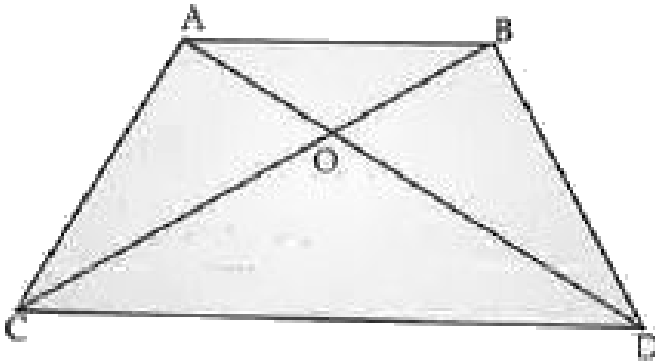
C. 3 cm

D. 4 cm

**Answer: C**

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13. In a trapezium ABCD,  $AB \parallel DC$ , Which of the following is a correct statement ?



A.  $\frac{OA}{OC} = \frac{OB}{OD}$

B.  $\frac{AD}{BC} = \frac{AB}{DC}$

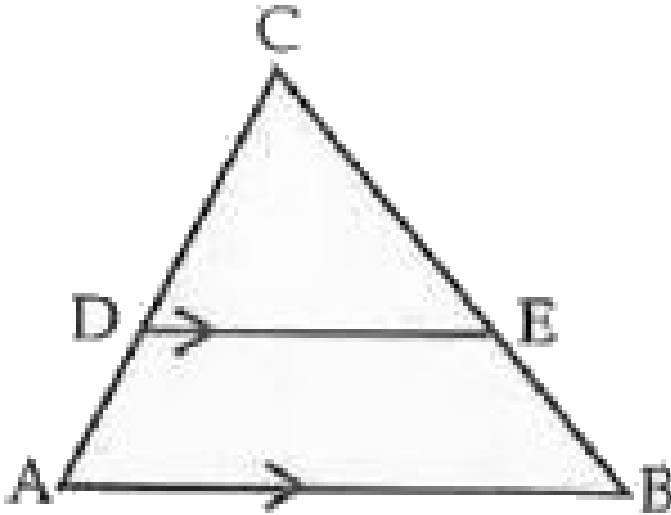
C.  $\frac{OB}{OD} = \frac{BC}{CD}$

D.  $\frac{OA}{OC} = \frac{AD}{DC}$

**Answer: A**

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14. In the following figure  $DE \parallel AB$ . If  $AD = 7cm$ ,  $CE = 10cm$  and  $CD = 5cm$ , then the length of  $BE =$



A. 17 cm

B. 14 cm

C. 12 cm

D. 20 cm

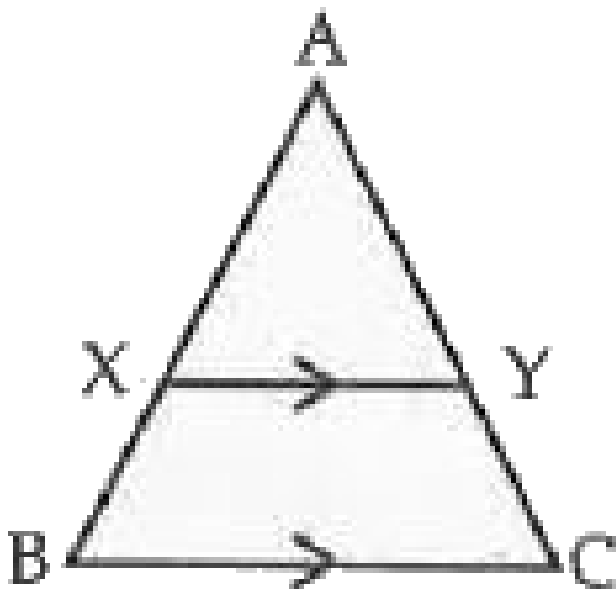
**Answer: B**



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15. In the figure,  $XY \parallel BC$ ,  $AX = 9\text{cm}$ ,  $XB = 4.5\text{cm}$  and  $BC = 18\text{cm}$ , then  $XY =$





A.  $14\text{cm}$

B.  $12\text{cm}$

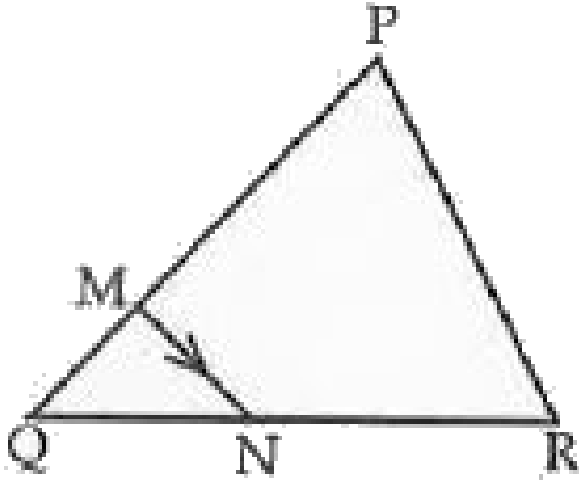
C.  $16\text{ cm}$

D.  $18\text{ cm}$

**Answer: B**

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16. in the figure,  $MN \parallel PR$ . If  $QN:NR = 2:3$  and  $PQ = 11.5\text{cm}$  then  $QM$  is equal to :

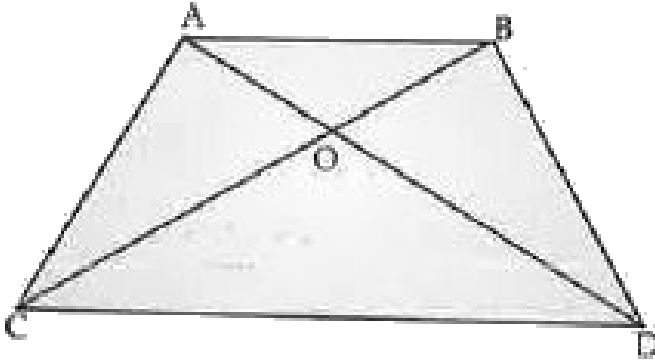


- A. 10 cm
- B. 2.3cm
- C. 4 cm
- D. 4.6cm

**Answer: D**

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17. In a trapezium ABCD,  $AB \parallel DC$ , Which of the following is a correct statement ?



A.  $\frac{AD}{BC}$

B.  $\frac{BC}{AD}$

C.  $\frac{AO}{AB}$

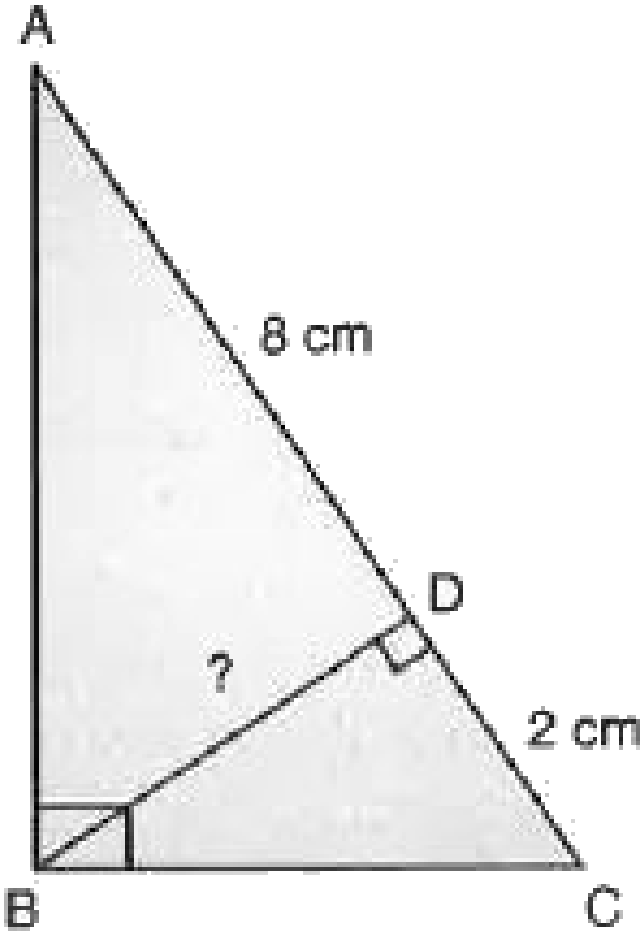
D.  $\frac{OB}{OC}$

**Answer: D**



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18. In the following figure,  $\angle ABC = 90^\circ$  and  $BD \perp AC$ . If  $AD = 8\text{ cm}$ ,  $CD = 2\text{ cm}$ , then the length of  $BD$  is :



A. 4 cm

B. 8 cm

C. 16 cm

D. 10 cm

**Answer: A**



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**19.** The corresponding sides of two equiangular triangles are :

A. Equal

B. Parallel

C. Proportional

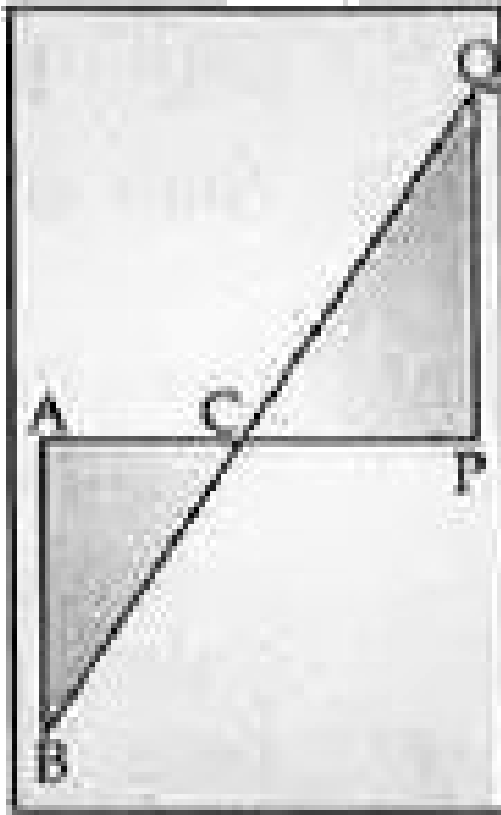
D. Unequal

**Answer: C**



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20. In the given  $\triangle ABC \sim \triangle PQC$ . The ratio of their corresponding sides is :



A.  $\frac{AB}{PQ} = \frac{BC}{PC} = \frac{AC}{QC}$

B.  $\frac{AB}{PC} = \frac{BC}{PQ} = \frac{AC}{QC}$

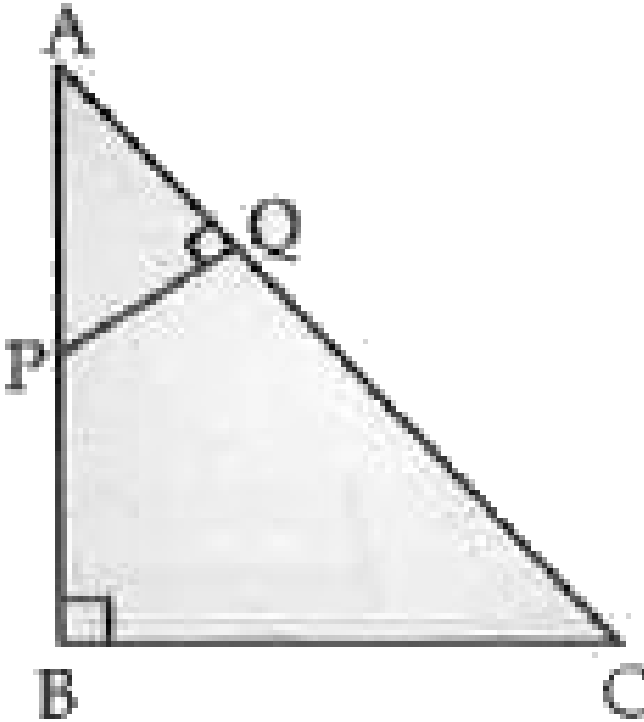
C.  $\frac{BC}{PQ} = \frac{AB}{QC} = \frac{AC}{PC}$

$$D. \frac{AB}{PQ} = \frac{BC}{QC} = \frac{AC}{PC}$$

Answer: D

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21. In the figure,  $\angle ABC = \angle AQP = 90^\circ$ , then  $\frac{AQ}{AB}$



A.  $\frac{BC}{PQ}$

B.  $\frac{AC}{PQ}$

C.  $\frac{QP}{BC}$

D.  $\frac{AP}{AB}$

**Answer: C**



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**22.** In  $\triangle ABC$  and  $\triangle DEF$  is  $\frac{AB}{DE} = \frac{BC}{DF}$  then they will be similar if:

A.  $\angle B$  and  $\angle E$

B.  $\angle A$  and  $\angle D$

C.  $\angle B$  and  $\angle D$

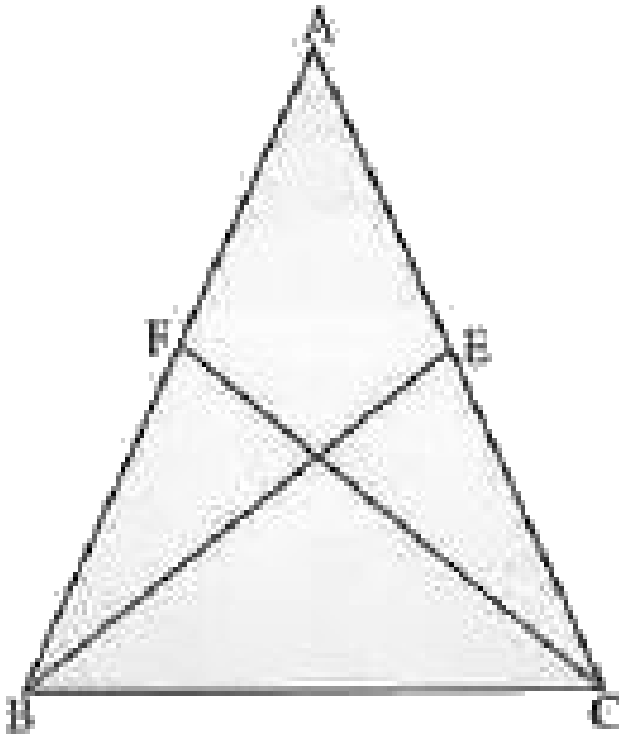
D.  $\angle A$  and  $\angle F$



Answer: C

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23. In the figure  $\triangle ABC$ ,  $BE \perp AC$  and  $CF \perp AB$ ,  
 $AD \perp BC$ , . then  $AF^2 + BD^2 + CE^2 =$



A.  $OA^2 + OB^2 + OC^2$

B.  $OD^2 + OE^2 + OF^2$

C.  $AB^2 + BC^2 + AC^2$

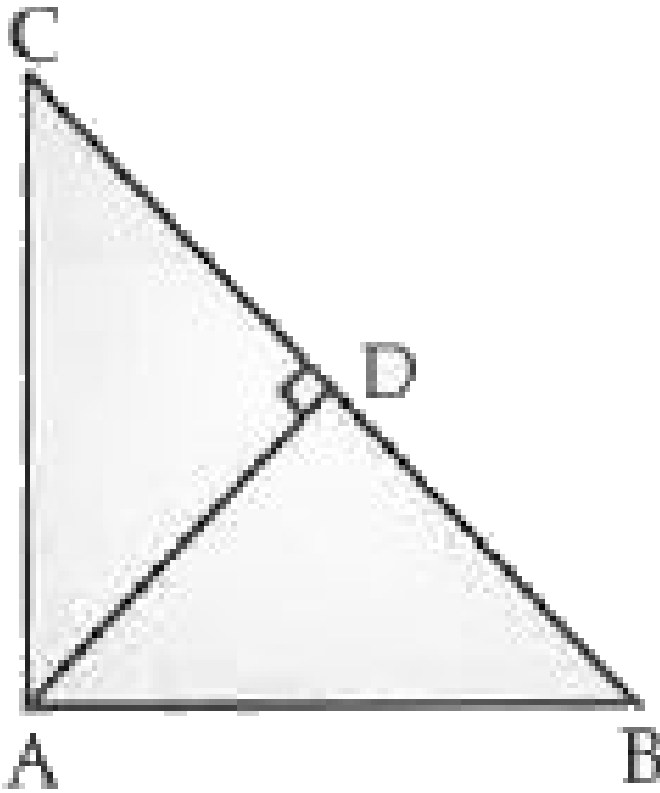
D.  $AE^2 + BF^2 + CD^2$

**Answer: D**



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**24.** In a right-angled triangle  $ABC$ ,  $\angle CAB = 90^\circ$ . If  $AD \perp BC$ , then the angle equal to  $\angle ACD$  is :

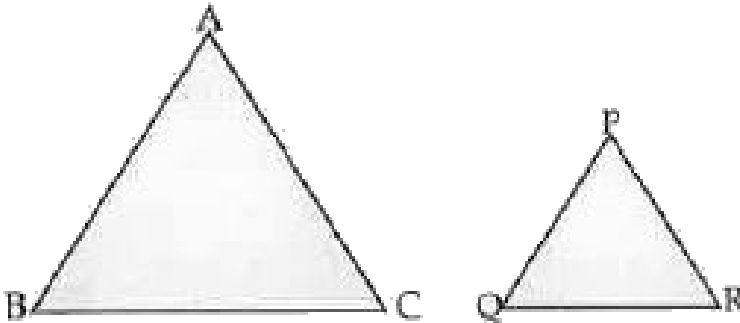


- A.  $\angle ABD$
- B.  $\angle DAB$
- C.  $\angle CAD$
- D.  $\angle ADE$

**Answer: B**



25. If the given triangles are similar, then the ratio between their sides is :



A.  $\frac{AB}{PQ} = \frac{BC}{QR} = \frac{AC}{PR}$

B.  $\frac{AB}{PR} = \frac{BC}{QR} = \frac{AC}{PQ}$

C.  $\frac{AB}{QR} = \frac{RC}{RP} = \frac{AC}{PQ}$

D.  $\frac{AB}{QR} = \frac{BC}{PQ} = \frac{AC}{RP}$

Answer: A



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26. Sides of a triangle are of length 2 cm, 3 cm and 4 cm respectively. Which of the sets of number are the sides of a triangle, similar to the above triangle ?

A. 4, 5, 6

B. 5, 6, 7

C. 12, 13, 14

D. 6, 9, 12

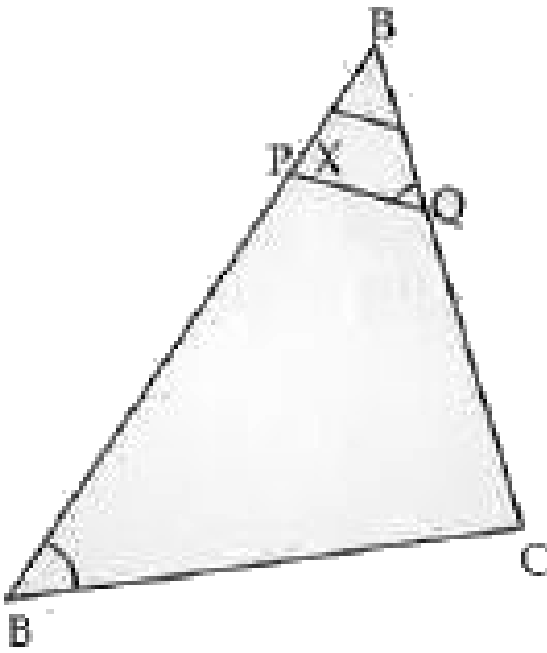
**Answer: D**



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27. In the figure  $\angle APQ = \angle ACB$  and  $\angle AQP = \angle ABC$ . Then

AP.AB is equal to :

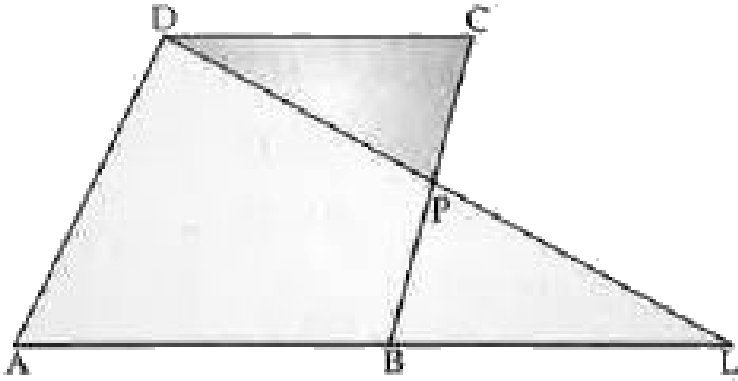


- A.  $AQ \cdot AC$
- B.  $AP \cdot AB$
- C.  $AC \cdot BC$
- D.  $BC \cdot AB$

**Answer: A**

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28. In parallelogram  $ABCD$ ,  $P$  is a point on  $BC$ . In  $\triangle DCP$  and  $\triangle BLP$ ,  $DP:PL$  is equal to :



- A.  $DC:BL$
- B.  $DC:BP$
- C.  $PC:BL$
- D.  $DC:PL$

**Answer: A**

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29. Select the set of numbers from the following which can form the similar triangles.

A. 9, 12, 18 and 3, 4, 6

B. 3, 4, 6 and 9, 10, 12

C. 8, 6, 12 and 2, 6, 3

D. 3, 4, 5 and 2, 4, 10

**Answer: A**



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30.  $\triangle ABC$  has sides of length 5 cm, 6 cm and 7 cm. The perimeter of  $\triangle DEF$  is 360 cm. If  $\triangle ABC \cong \triangle DEF$  then the ratio of the ratio of the perimeters of  $\triangle ABC$  and  $\triangle DEF$  is :

A. 1 : 2



B. 2 : 1

C. 1 : 20

D. 20 : 1

**Answer: C**



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## Topic 1 Basic Proportionality Theorem Very Short Answer Type Questions

1. State "Basic proportionality theorem"



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2. In  $\triangle ABC$ ,  $XY \parallel BC$ ,  $\frac{AY}{CY} = \frac{1}{2}$  and  $AX = 4$ . Find  $BX$ .

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3. State Thales theorem.

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4. In  $\triangle ABC$ , DE is parallel to BC, If  $\frac{AD}{DE} = \frac{3}{5}$  and  $AC = 4.8\text{cm}$ , then find AE.

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5. What is the name of the quadrilateral formed by joining the midpoint of sides of a given quadrilateral ?

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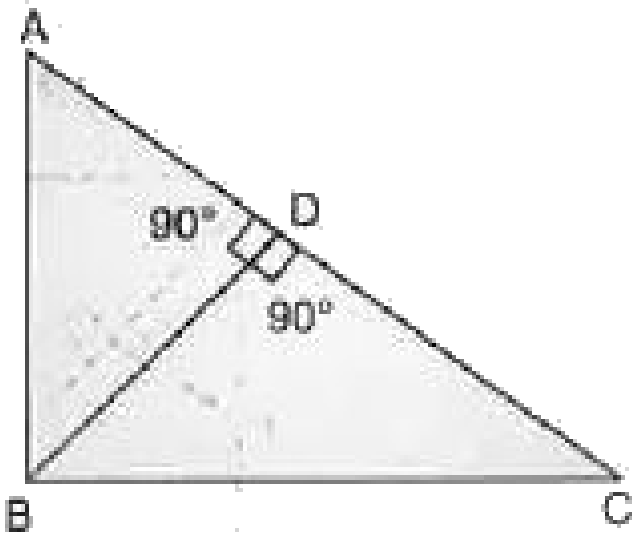
6. In  $\triangle ABC$ ,  $AB = 6\text{cm}$  and  $DE \parallel BC$  such that  $AE = \frac{1}{4}AC$ , then what is AD ?

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7. In  $\triangle ABC$ ,  $D$  and  $E$  are points on side  $AB$  and  $AC$  respectively such that  $DE \parallel BC$  and  $AD:DB = 3$ , If  $EA = 3.3\text{cm}$ , then find  $AC$ .

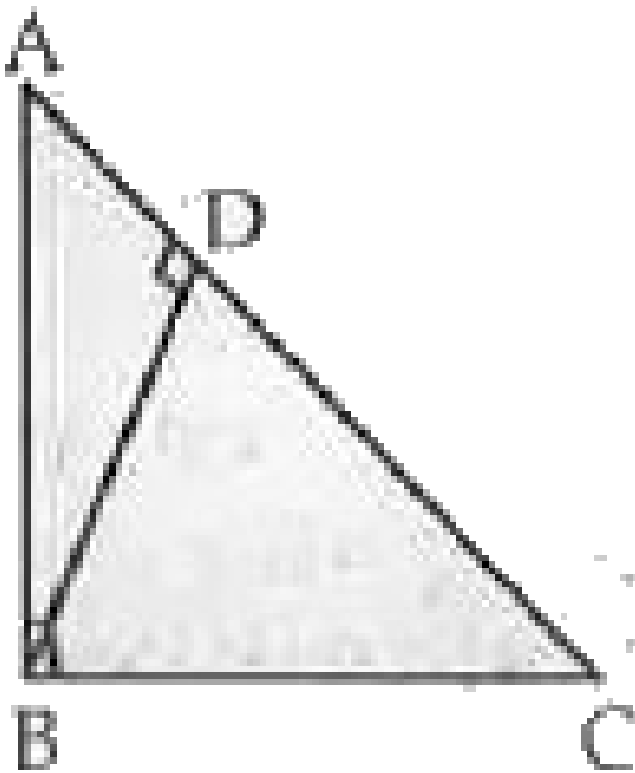
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8. In the adjoining figure  $\angle ABC = 90^\circ$  and  $BD \perp AC$ , express  $(AD = DC)$ , in terms of  $BD$  ?



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9. In  $\triangle ABC = 90^\circ$ ,  $BD \perp AC$ . If  $BD = 8\text{cm}$  and  $AD = 4\text{cm}$ , find  $CD$ .



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10. For two similar triangles ABC and PQR,  $\angle A = 40^\circ$ ,  $\angle B = 60^\circ$ , then what is  $\angle R$ ?

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11. Give two different examples of pair of similar figures.

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12. If  $\triangle ABC$  and  $\triangle DEF$  are similar and  $2AB = DE$ ,  $BC = 8\text{cm}$ , then calculate EF.

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13. If  $\triangle ABC \sim \triangle PQR$ , perimeter ( $\triangle ABC$ ) =  $20\text{cm}$ , perimeter ( $\triangle PQR$ ) =  $20\text{cm}$  and  $AB = 8\text{cm}$ , then find PQ.

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14. If  $\triangle ABC \sim \triangle PQR$ , then find  $\angle B$ .

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15. If  $\triangle PQR$  is congruent to  $\triangle STU$ , then what is the length of  $TU$ ?

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16. In  $\triangle ABC$  and  $\triangle DEF$ ,  $\angle B = \angle E$ ,  $\angle F = \angle C$  and  $AB = 2DE$ , then what do we use to call these two triangles?

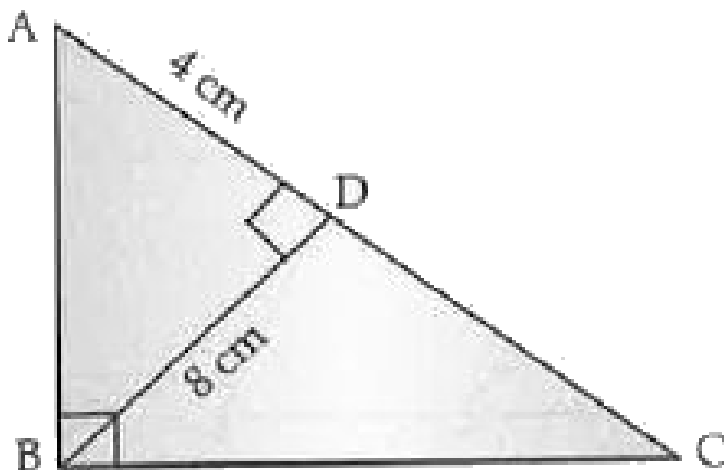
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17. In  $\triangle ABC$ ,  $AD$  is the bisector of  $\angle BAC$ . If  $AB = 8\text{cm}$ ,  $BD = 6\text{cm}$  and  $DC = 3\text{cm}$ , then find  $AC$ .

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## Topic 1 Basic Proportionality Theorem Short Answer Type Questions

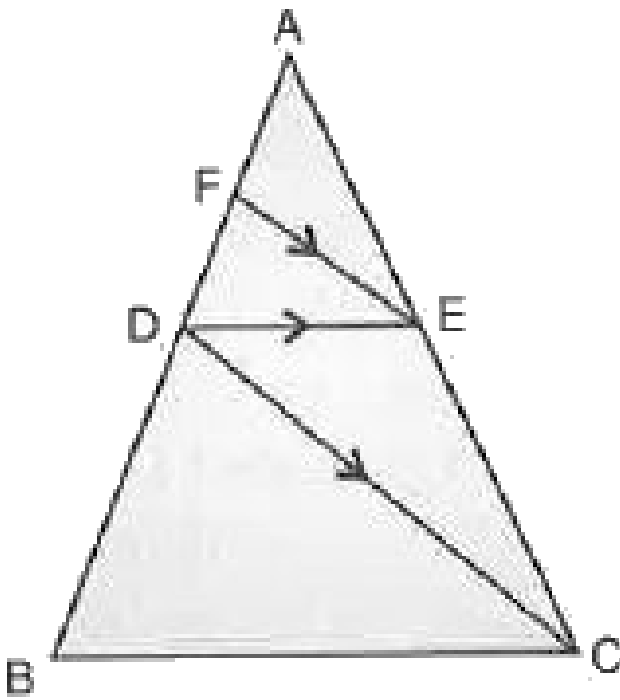
1. In  $\triangle ABC$ ,  $\angle ABC = 90^\circ$ ,  $BD \perp AC$ . If  $BD = 8\text{ cm}$ ,  $AD = 4\text{ cm}$ , find  $CD$ .



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2. In  $\triangle ABC$ ,  $DE \parallel BC$  and  $CD \parallel EF$ . Prove that  $AD^2 = AF \cdot AB$ .

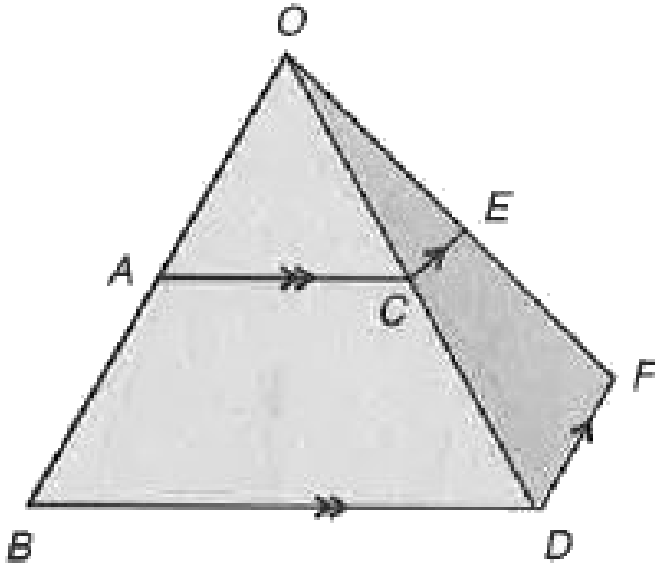




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3. In the following figure,  $AC \parallel BD$  and  $CE \parallel DF$ . If

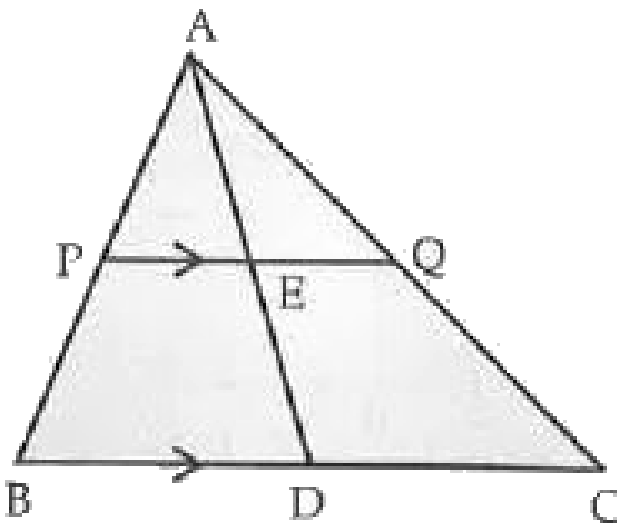
$OA = 13\text{cm}$ ,  $AB = 9\text{cm}$ ,  $OC = 8\text{cm}$  and  $EF = 4.5\text{cm}$ , find  $OE$ .



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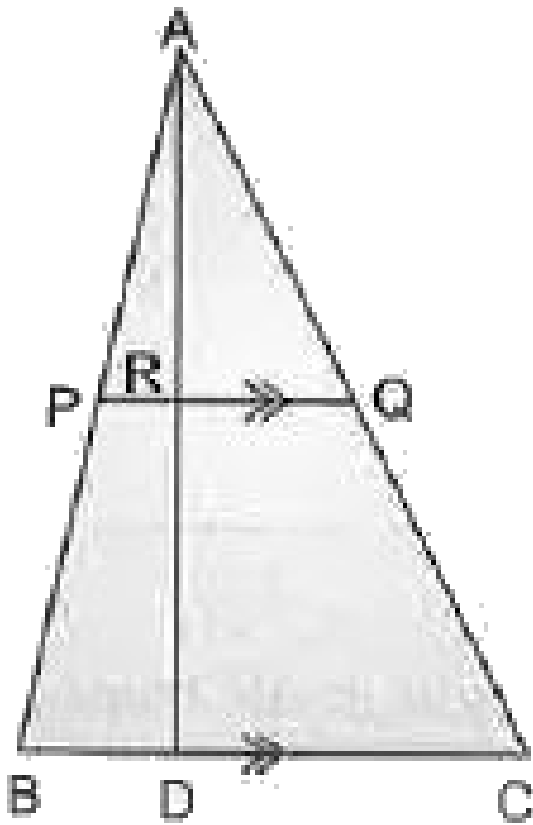
4. In  $\triangle ABC$ ,  $AD$  is the median and  $PQ \parallel BC$ . Prove that

$$PE = EQ$$



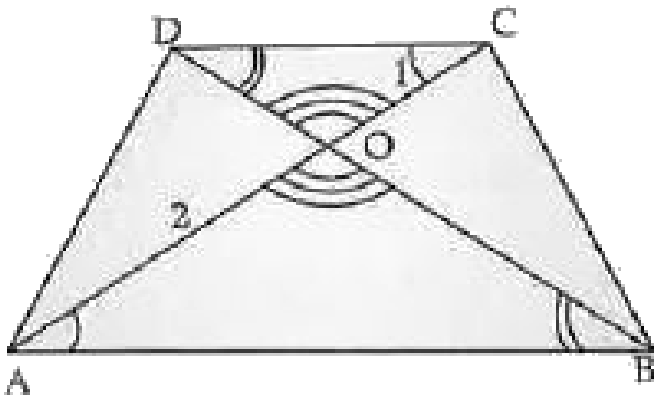
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5. In  $\triangle ABC$ ,  $PQ \parallel BC$ ,  $AP = 3\text{cm}$ ,  $AR = 4.5\text{cm}$ ,  $AQ = 6\text{cm}$ ,  $AB = 5\text{cm}$  and  $AC = 10\text{cm}$ . Find the length of  $AD$ .



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6. If one diagonal of a trapezium divides the other in the ratio 1 : 2, then prove that one of the parallel sides is twice the other.



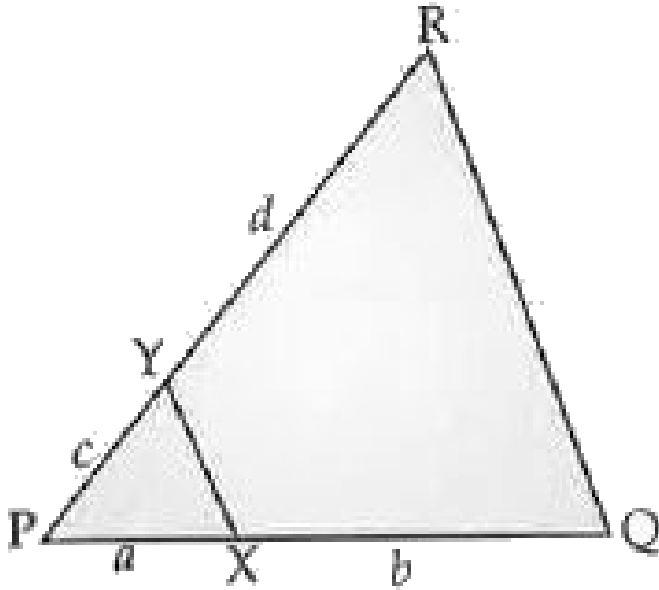
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7. A ladder resting against a vertical wall has its foot on the ground at the distance of 6 cm from wall. A man climbs two third of the ladder. What will be his distance from the wall now ?

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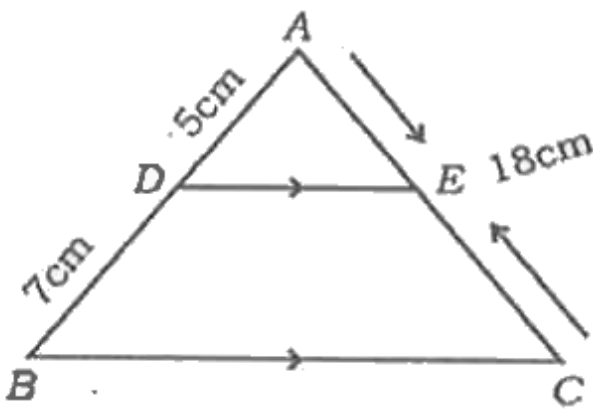
8. Study the following figure. Write the ratios in relation to basic proportionality theorem and its corollary, in terms of  $a$ ,  $b$ ,  $c$  and

d.



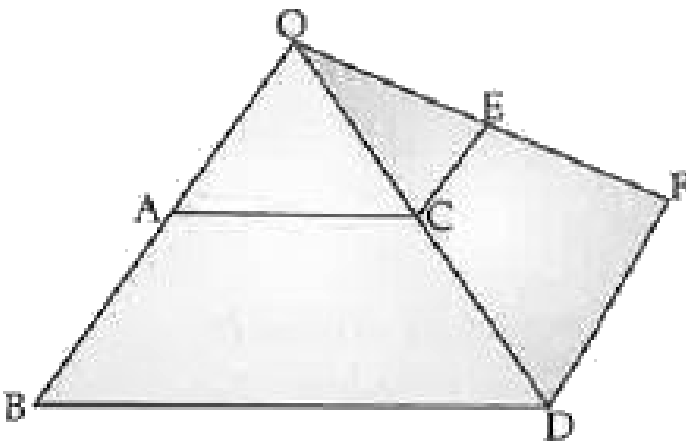
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9. In  $\triangle ABC$ ,  $DE \parallel BC$ . If  $AD = 5$  cm,  $BD = 7$  cm and  $AC = 18$  cm, find the length of  $AE$ .



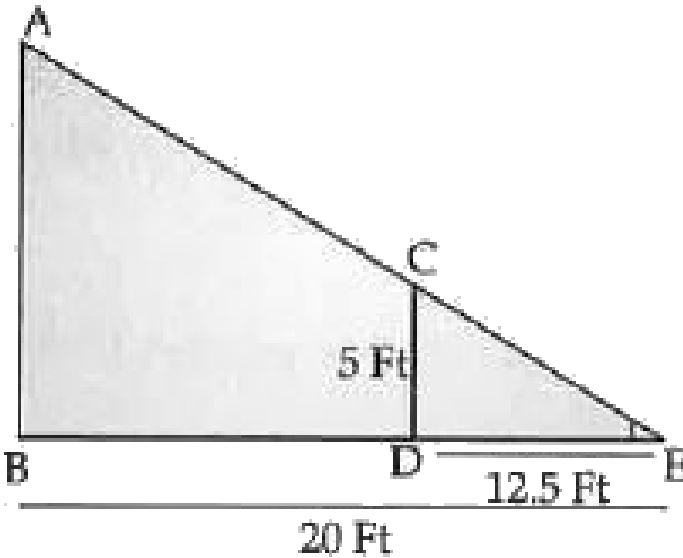
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10. In the given figure,  $AC \parallel BD$  and  $CE \parallel DF$ . If  $OA = 12\text{cm}$ ,  $AB = 9\text{cm}$ ,  $OC = 8\text{cm}$  and  $EF = 4.5\text{cm}$ , find  $OE$ .



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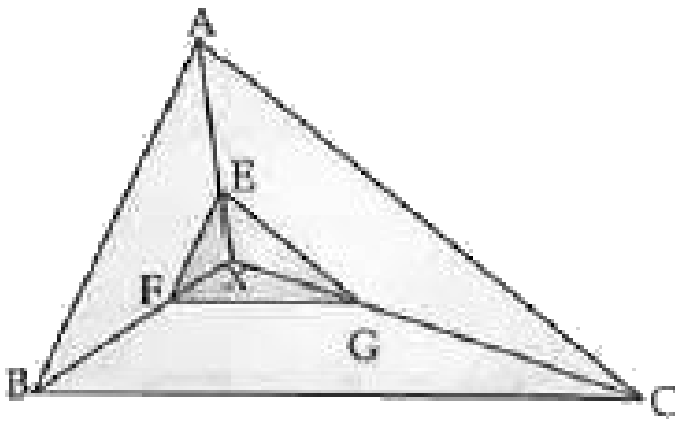
11. At certain times of the day trees casts its shadow 12.5 feet long. If the height of the tree is 5 feet, find the height of another tree the casts its shadow 20 feet long at the same times.



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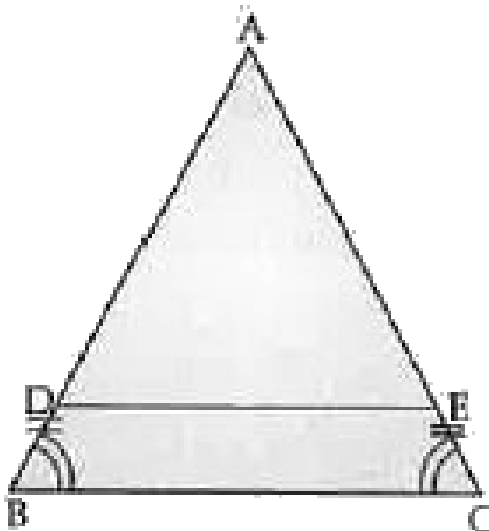
12.  $X$  is any point inside  $\triangle ABC$ ,  $XA$ ,  $XB$  and  $XC$  are joined 'E' is any point on  $AX$ . If  $EF \parallel AB, FG \parallel BC$ . Prove that  $EG \parallel AC$ .





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13. In  $\triangle ABC$ ,  $\angle B = \angle C$ , D and E are the points on AB and AC such that  $BD = CE$ , prove that  $DE \parallel BC$ .





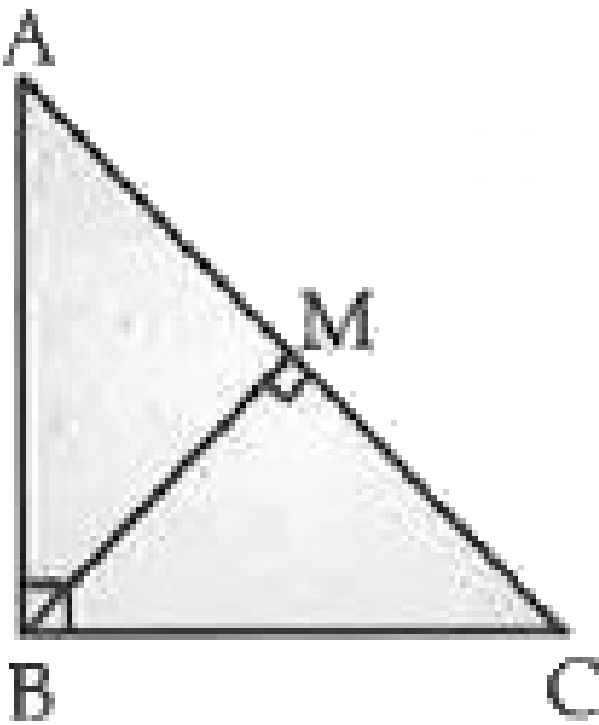
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14.  $\triangle ABC \sim \triangle DEF$ , Area of  $\triangle ABC = 64\text{cm}^2$  and area of  $\triangle DEF = 121\text{cm}^2$ . If  $EF = 15.4\text{cm}$ , Find BC.



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15. In  $\triangle ABC$ ,  $\angle ABC = 90^\circ$ ,  $BM \perp AC$ ,  $AM = 8x^2$ ,  $CM = 2x^2$ , find BM and AB.



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16. From the following data, State whether  $\triangle ABC$  is similar to  $\triangle DEF$  or not :

(a)  $\angle A = 70^\circ$ ,  $\angle B = 80^\circ$ ,  $\angle D = 70^\circ$ ,  $\angle F = 30^\circ$

(b)  $AB = 8\text{cm}$ ,  $BC = 9\text{cm}$ ,  $CA = 15\text{cm}$ ,  $DE = 4\text{cm}$ ,  
 $EF = 3\text{cm}$ ,  $FD = 5\text{cm}$ .



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17. Select the set of numbers in the following, which can form similar triangles.



(I) 3, 4, 6 (II) 9, 12, 18

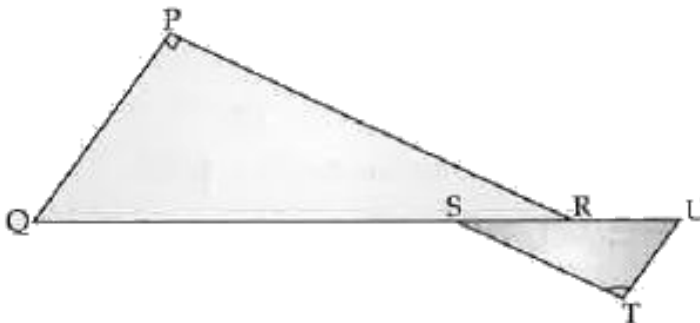
(III) 8, 6, 12 (IV) 3, 4, 9



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18. In the figure,  $\angle QPR = \angle UTS = 90^\circ$  and  $PR \parallel TS$ . Prove that

Prove that   $PQR \sim$    $TUS$ .

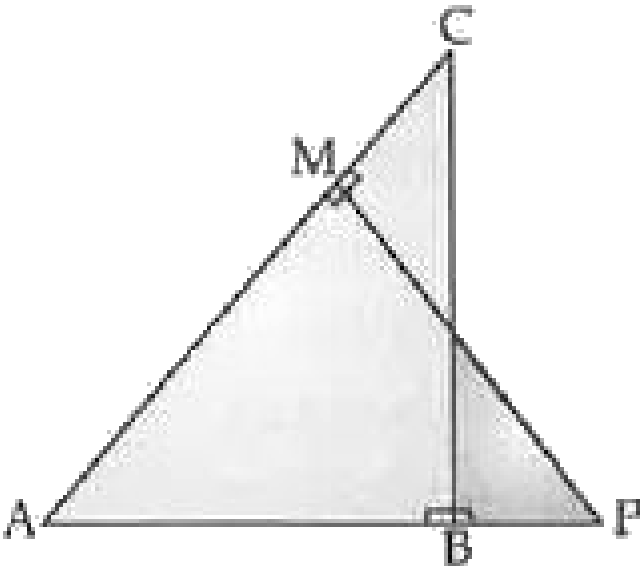


19. In the following figure,  $\angle ABC = 90^\circ$  and  $\angle AMP = 90^\circ$ .

Prove that : (i)

(i)   $ABC \sim$    $AMP$

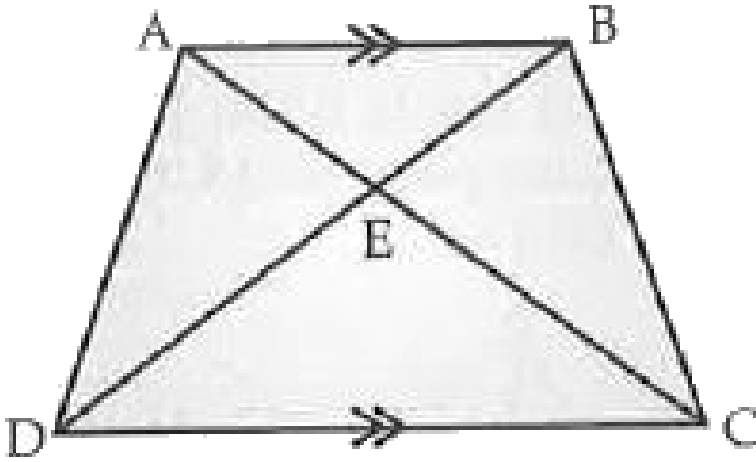
(ii)  $\frac{CA}{PA} = \frac{BC}{MP}$



## Topic 1 Basic Proportionality Theorem Long Answer Type Questions

1. In the trapezium  $ABCD$ ,  $AB \parallel DC$  and  $\triangle ARD \sim \triangle BEC$ . Then

Prove that  $AD = BC$ .



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2. If a straight line divides two sides of a triangle proportionally, then the straight line is parallel to the third side, (Converse of Thales theorem). Prove.



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3. In a trapezium, prove that the line joining the midpoints of non-parallel sides are parallel to the parallel sides of the trapezium.



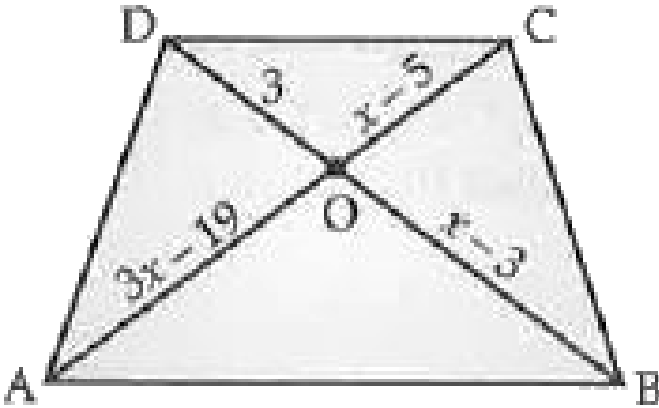
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4. In a trapezium ABCD,  $AB \parallel CD$

$$\text{If } OA = 3x - 19$$

$$OC = 3 - 5$$

$BO = x - 3$  and  $OD = 3$ , find  $x$



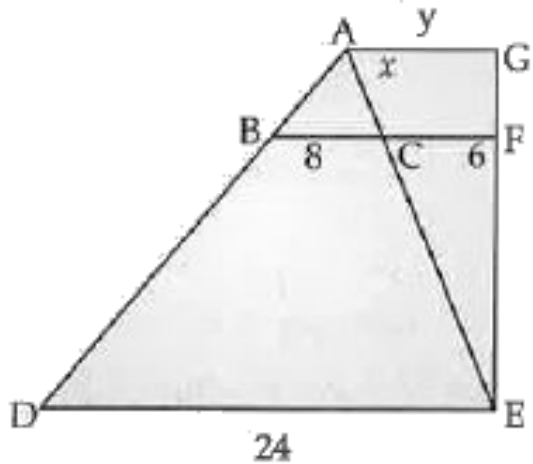
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5. Find the unknown values in each of the following figures. All lengths given in centimetres. (Measures are not in scale)

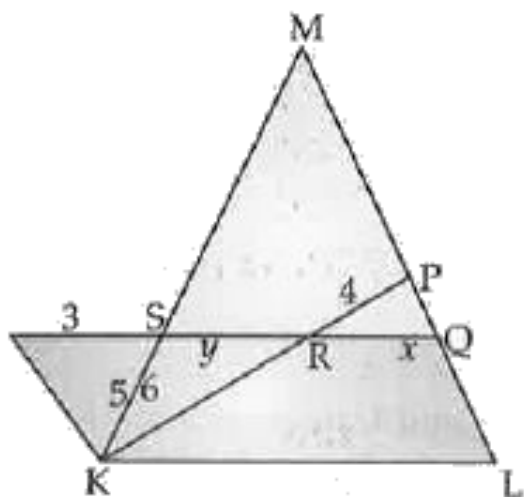
(a)



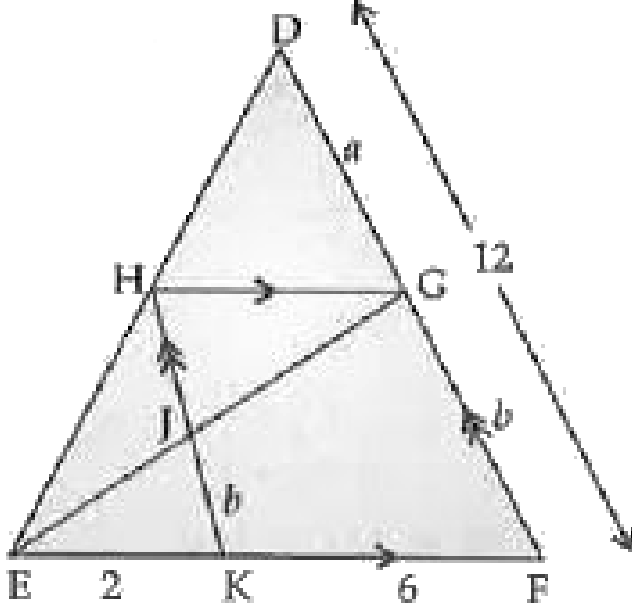
(a)



(b)



(c)



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6. In  $\triangle ABC$ , D and E are points in the sides AB and AC respectively such that  $DE \parallel BC$ . If  $AD = 6\text{cm}$ ,  $DB = 9\text{cm}$ , and  $AE = 8\text{cm}$  find AC.

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7. E and F are points on the sides PQ and PR respectively of  $\Delta$  PQR. For each of the following cases, state whether  $EF \parallel QR$ :

(i)  $PE = 3.9\text{cm}$ ,  $EQ = 3\text{cm}$ ,  $PF = 3.6\text{cm}$ ,  $FR = 2.4\text{cm}$

(ii)  $PE = 4\text{cm}$ ,  $QE = 4.5\text{cm}$ ,  $PF = 8\text{cm}$ ,  $RF = 9\text{cm}$

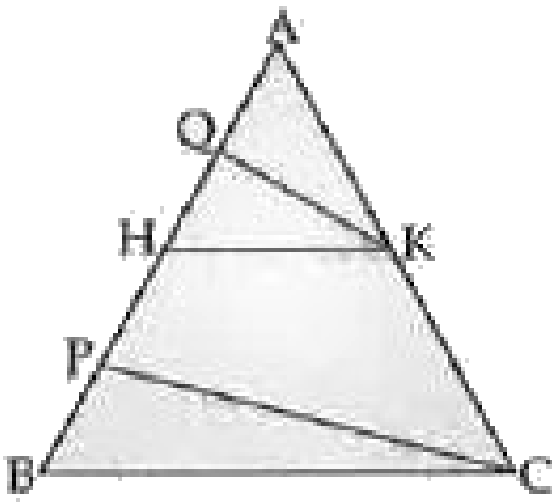
(iii)

$PQ = 1.28\text{cm}$ ,  $PR = 2.56\text{cm}$ ,  $PE = 0.18\text{cm}$ ,  $PF = 0.36\text{cm}$



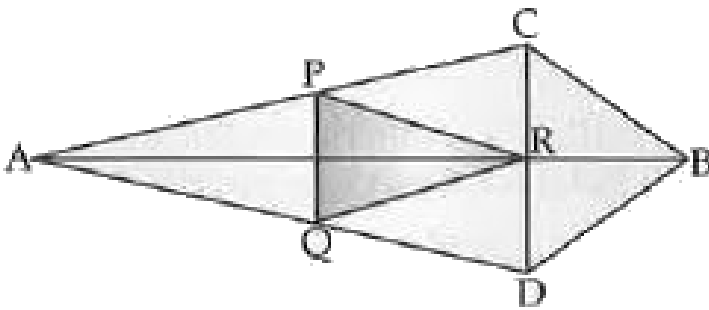
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8. In the figure,  $PC \parallel QK$  and  $BC \parallel HK$ . If  $AQ = 6\text{cm}$ ,  $QH = 4\text{cm}$ ,  $HP = 5\text{cm}$  and  $KC = 18\text{cm}$ . Find AK and PB.



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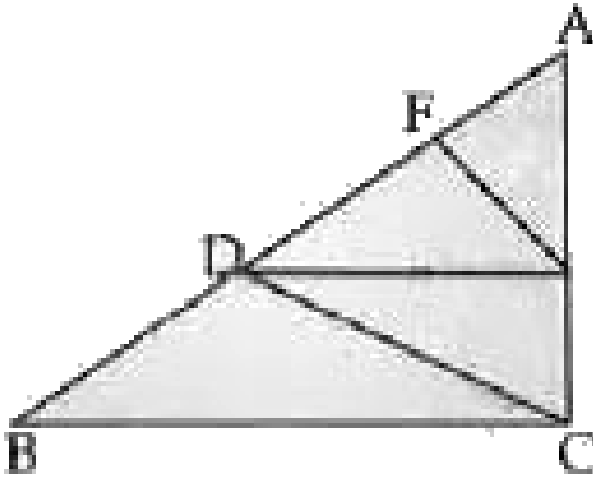
9. In the figure,  $PR \parallel RC$  and  $QR \parallel BD$ . Prove that  $PQ \parallel CD$ .



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10. In  $\triangle ABC$ ,  $DE \parallel BC$  and  $CD \parallel EF$ . Prove that

$$AD^2 = AF \times AB$$

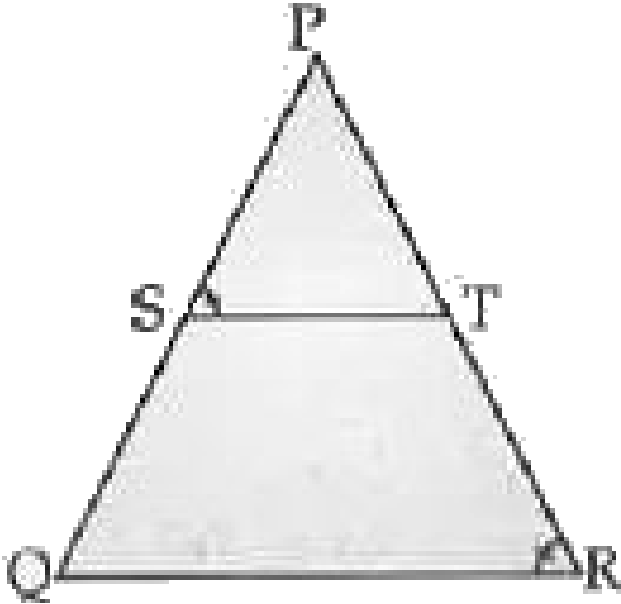


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11. If the diagonals of a quadrilateral divide each other proportionally, then prove that the quadrilateral is a trapezium.

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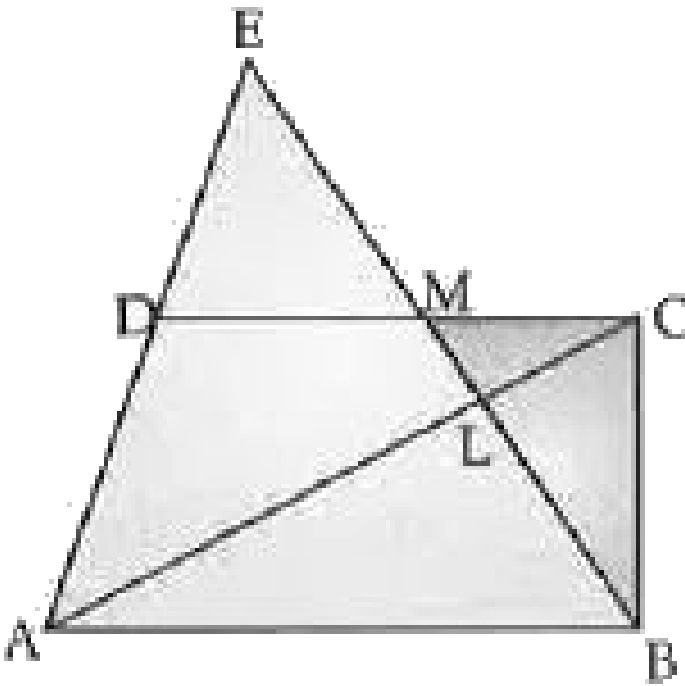
12. In the given figure,  $\frac{SP}{SQ} = \frac{PT}{TR}$  and  $\angle PST = \angle PRQ$ . Prove that  $PQR$  is an isosceles triangle.



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13. In a  $\triangle ABC$ , let  $P$  and  $Q$  be points on  $AB$  and  $AC$  respectively such that  $PQ \parallel BC$ . Prove that the median  $AD$  bisects  $PQ$ .

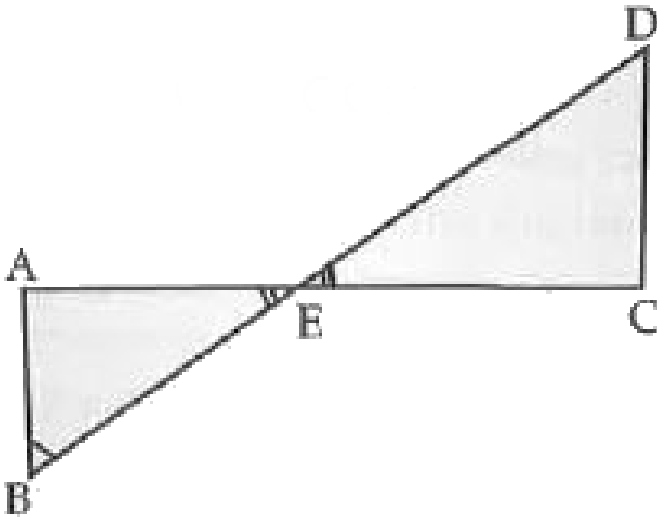
14. Through the mid-point  $M$  of the sides of a parallelogram  $ABCD$ , the line  $BM$  is drawn intersecting  $AC$  at  $L$ , and  $AD$  produced to  $E$ . Prove that  $EL = 2BL$ .



15. Prove that the two medians of a triangle divide each other in the ratio 2:1

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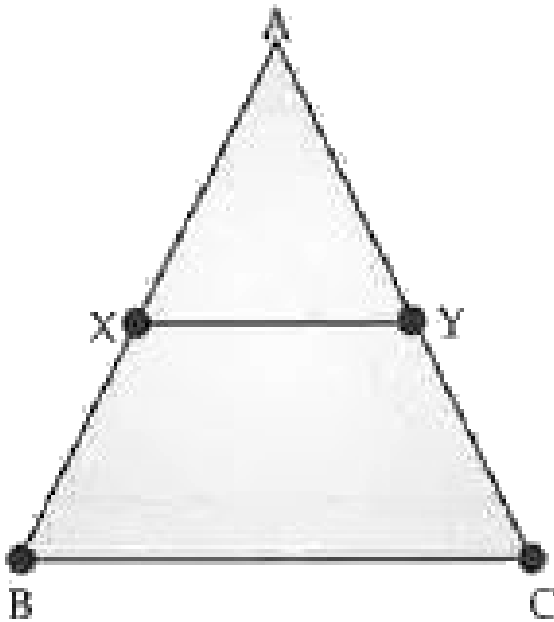
16. In the given figure  $\angle ABD = \angle BDC$  and  $CD = 4AB$ . Show that  $BD = 5BE$ .



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1. In a  $\triangle ABC$ ,  $XY \parallel BC$  and  $XY = \frac{1}{2}BC$ . If the area of  $\triangle AXY = 10\text{cm}^2$ . Find the area of trapezium  $XYCB$ .



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2. State and prove Basic proportionality theorem



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3. In a trapezium ABCD,  $AB \parallel AD$  and  $DC = 2AB$ .  
 $EF \parallel AB$ , cuts AD in F and BC in E such that  $\frac{BE}{EC} = \frac{3}{4}$ .

Diagonal DB intersects EF at G. Prove that,  $7EF = 10AB$ .



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4. Let ABC be a triangle and D and E be two points on sides AB such that  $AD = BE$ . If  $DP \parallel BC$  and  $EQ \parallel AC$ , then prove that  $PQ \parallel AB$ .



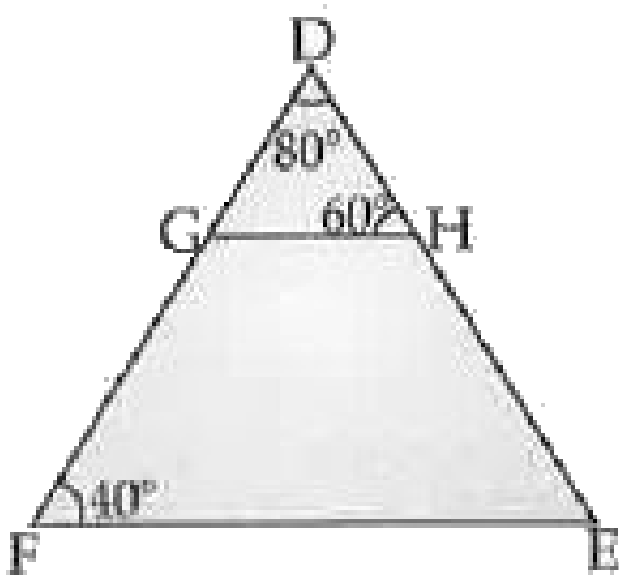
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5. Prove that "If two triangles are equiangular, then their corresponding sides are proportional".



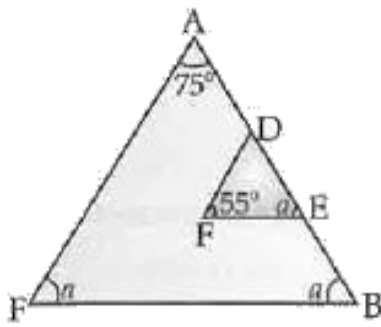
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6. Study the following figures and find out in each case whether the triangles are similar. Give reason. (a)

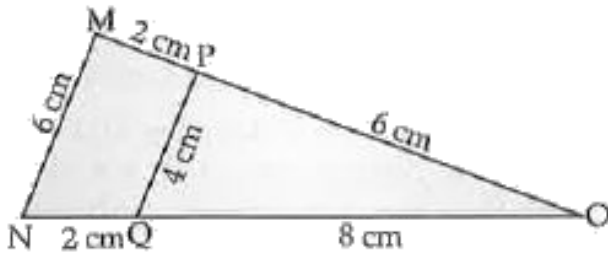


(b)

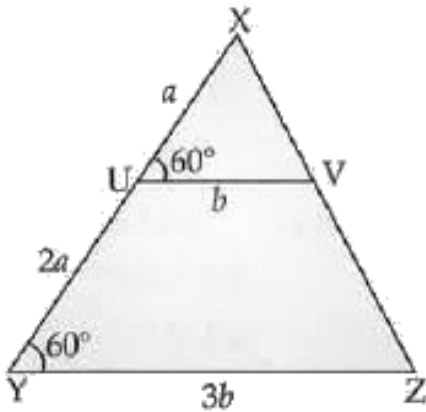
(b)



(c)



(d)



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1. The sides of two triangles are in the ratio 2:3. Then their areas are in the ratio :

A. 9:4

B. 4:9

C. 2:3

D. 3:2

**Answer: B**



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2. In the given figure,  $AB = CF$ ,  $EF = BD$   $\angle AFE = \angle DBC$ . Prove that

$\triangle AFE = \triangle CBD$



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3. Triangles ABC and DEF are similar. The area of  $\triangle ABC$  is  $16\text{cm}^2$ , and that of  $\triangle DEF$  is  $25\text{cm}^2$ . If  $BC=2.3$  cm, find EF



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4. The corresponding sides of two similar triangles are in the ratio 4: 9. The ratio between their areas is :

A. 2: 3

B. 16: 18

C. 81: 16

D. 14: 19

**Answer: B**



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5. If the ratio of the perimeter of two similar triangles is 4:25, then find the ratio of the areas of the similar triangles

A.

B.

C.

D.

**Answer: A**

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6. Which of the following is not a correct statement ?

A. All the rectangles are similar

B. All the rhombus are similar



C. All the right angled triangles are similar

D. All the equilateral triangles are similar

**Answer: D**

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7. The area of two similar triangles ABC and PQR are ' $25 \text{ cm}^2$ ' and ' $49 \text{ cm}^2$ '. If  $QR = 9.8 \text{ cm}$  then BC is

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8. Two similar triangles have areas  $120 \text{ sq. cm}$  and  $480 \text{ sq. cm}$  respectively. Then the ratio of any pair of corresponding sides is :

A. 1 : 4

B. 1:2

C. 4:1

D. 2:3

**Answer: B**



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9. In a  $\Delta ABC$ , D,E,F are respectively, the mid- points of BC,CA, and AB. If the lengths of side AB, BC and CA are 7 cm, 8 cm, 9 cm, respectively, find the perimeter of  $\Delta DEF$ .

A.  $12cm$

B.  $21cm$

C.  $24cm$

D.  $18cm$

**Answer: A**



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10. The area (A) of triangle, whose base is 4 units longer than its altitude (x) is :

A.  $A = \frac{1}{2}x(x - 4)$

B.  $A = \frac{1}{2}x(x + 4)$

C.  $A = \frac{1}{2}(4x)$

D.  $A = \frac{1}{2}x(x + 4x)$

**Answer: B**



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## Topic 3 Area Of Similar Triangles Very Short Answer Type Questions

1. What is the ratio of areas of two similar triangles whose sides are in the ratio 15: 19 ?

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2. The areas of two similar triangles are  $81\text{cm}^2$  and  $49\text{cm}^2$  respectively. What is the ratio of their corresponding sides ?

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3. If  $\triangle ABC \sim \triangle PQR$  with  $\frac{BC}{QR} = \frac{1}{3}$ , then find  $\frac{\text{ar} \triangle PRQ}{\text{ar} \triangle BCA}$  ?

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4. If two triangles are similar such that the ratio of their areas is 25:16, then is the ratio of their corresponding medians ?

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5. If  $\triangle ABC \sim \triangle DEF$ ,  $BC = 3\text{cm}$ ,  $EF = 4\text{cm}$ , and Area of  $\triangle ABC = 54\text{cm}^2$ , then Area of  $\triangle DEF$  is

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6. The areas of two similar triangles are  $121\text{cm}^2$  and  $64\text{cm}^2$  respectively. If The median of first triangle is  $12.1\text{cm}$ , then what is the corresponding median of the other triangle ?

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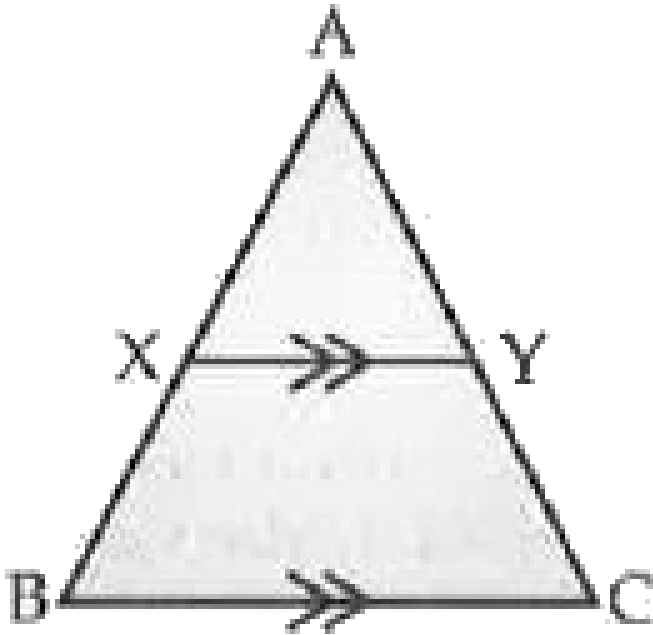
### Topic 3 Area Of Similar Triangles Short Answer Type Questions

1. If the area of the similar triangles are equal, then they are congruent. Prove.

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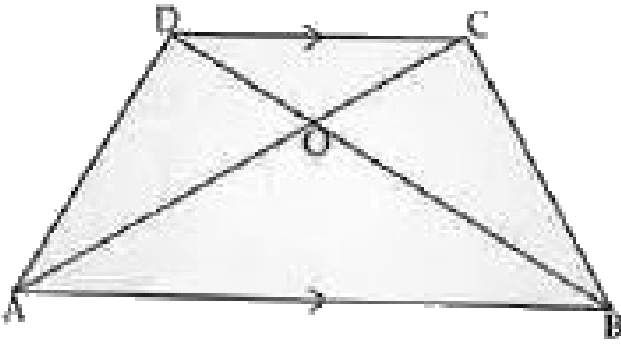
2. In  $\triangle ABC$ ,  $XY \parallel BC$  and  $XY$  divides the triangle into two parts of equal area. Find  $BX : AB$ .

[Hint :  $ABC = 2\Delta AXY$ ]



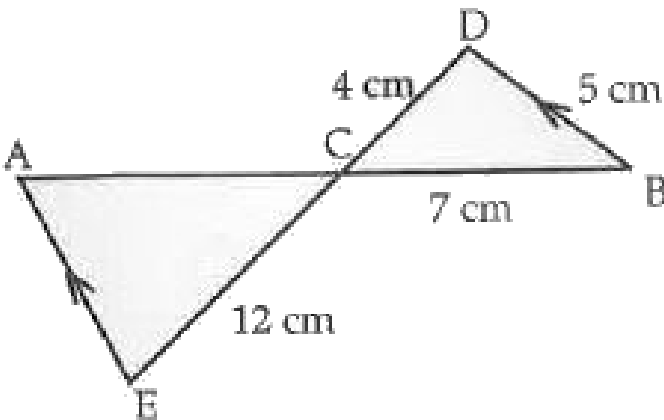
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3. In the trapezium  $ABCD$ ,  $AB \parallel CD$ ,  $AB = 2CD$  and  $ar(\Delta AOB) = 84cm^2$ , find the area of  $\Delta COD$ .



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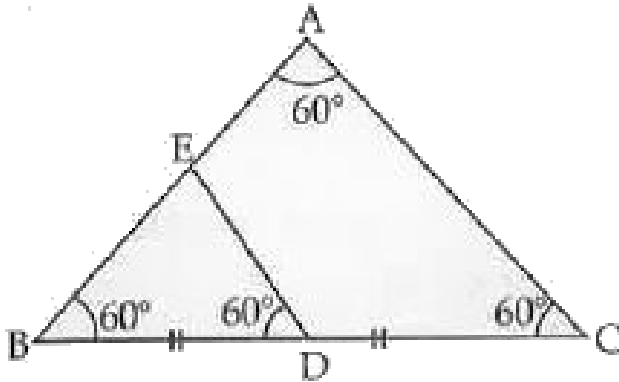
4. In the given figure,  $AE \parallel DB$ ,  $BC = 7\text{cm}$ ,  $BD = 5\text{cm}$ ,  $DC = 4\text{cm}$ . If  $CE = 12\text{cm}$ , find  $AE$  and  $AC$



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5.  $\triangle ABC$  and  $\triangle BDE$  are two equilateral triangles and  $BD = DC$ . Find the ratio between areas of  $\triangle ABC$  and  $\triangle BDE$ .



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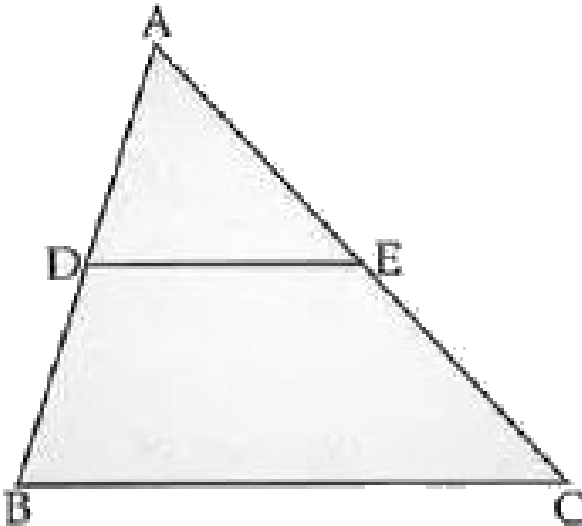
6. The corresponding altitudes of two similar triangles are 6 cm and 9 cm respectively. Find the ratio their areas.

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7. Find the ratio between areas of  $\triangle AOB$  and  $\triangle COD$ , if  $AB = 3CD$

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8. In the given figure  $DE \parallel BC$ . If  $AD = 1.5\text{cm}$ ,  $BD = 2AD$ , then find  $\frac{\text{ar}(\triangle ADE)}{\text{ar}(\text{trapezium } BCED)}$



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1. D, E and F are the mid-points of sides of  $\triangle ABC$ . P, Q, R are the mid-points of sides DEF. This process of marking the mid-points and forming a new triangle is continued. How are the areas of these triangles related?



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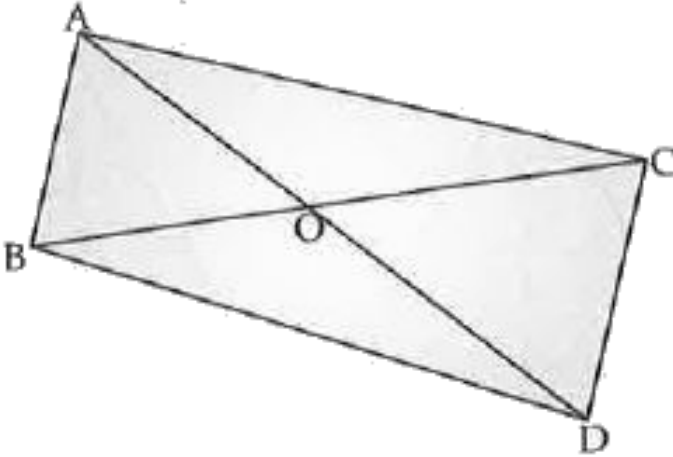
2. Two isosceles triangles are having equal vertical angles and their areas are in the ratio 9:16. Find the ratio of their corresponding altitudes.



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3.  $\triangle ABC$  and  $\triangle BDC$  are on the same base BC. Prove that

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



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### Topic 3 Area Of Similar Triangles Long Answer Type Questions II

1. Prove that “the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides”.

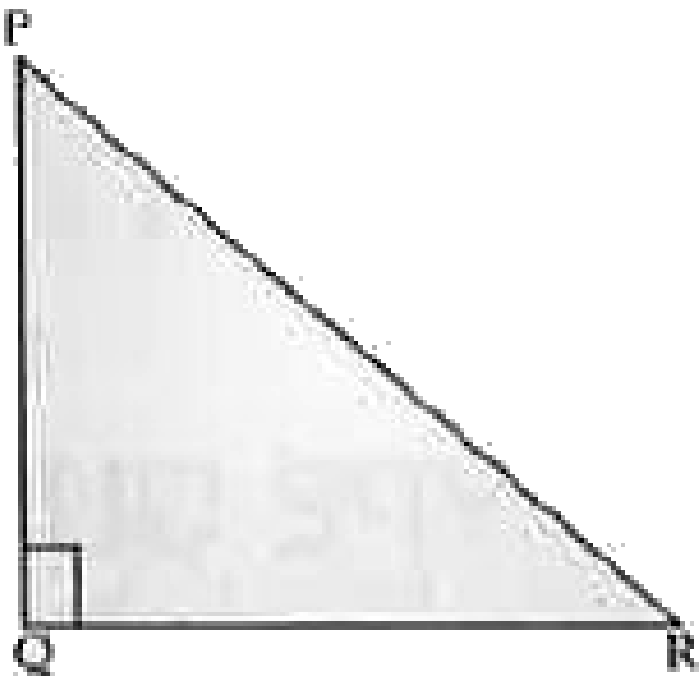
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2. If the areas of two-similar triangles are equal, prove that the they are congruent.

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#### Topic 4 Pythagorean Triplets Multiple Choice Questions

1. In  $\Delta PQR$ ,  $\angle PQR = 90^\circ$ , The correct relation with respect in  $\Delta PQR$  is :



A.  $PR^2 = PQ^2 - QR^2$

B.  $PQ^2 = QR^2 - PR^2$

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

D.  $QR^2 = PQ^2 - PR^2$

Answer: C



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2. In  $\triangle ABC$ ,  $\angle ABC = 90^\circ$ , if  $AC = (x + y)$  and  $BC = (x - y)$ , then length of AB is :

A.  $x^2 - y^2$

B.  $2xy$

C.  $2\sqrt{xy}$

D.  $x^2 - y^2$

Answer: C



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3. Which one of the following groups is a pythagorean triplet ?

A. 3, 4, 5

**B.** 1, 2, 3

**C.** 2, 3, 4

**D.** 9, 10, 14

**Answer: A**



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**4. The Pythagorean triplets among the following is :**

**A.** 8, 15, 17

**B.** 5, 8, 17

**C.** 5, 12, 17

**D.** 3, 6, 9

**Answer: A**



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5. Which one of the following is Pythagorean Triplet ?

A. 8, 15, 16

B. 8, 15, 18

C. 10, 60, 61

D. 8, 15, 17

Answer: D

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6. "If the square of one side of a triangle is equal in the sum of squares on the other two sides, then those two sides contain a right angle ." This statement refers to :

A. Pythagoras theorem

B. Thales theorem

C. Converse of Thales theorem.

D. Converse of Pythagoras theorem

Answer: D



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7. The length of a diagonal of a square of sides 5 cm is :

A.  $5\sqrt{2}cm$

B.  $2\sqrt{5}cm$

C. 10 cm

D.  $10\sqrt{2}cm$

**Answer: A**

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**8. From the figure, the length of AD is :**

**A. 12 cm**

**B. 14 cm**

**C. 11 cm**

**D. 13 cm**

**Answer: D**

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9. A straight pole of height 2 ft casts a shadow of 6 ft long at a definite time. The height of another pole which casts a shadow of 12 ft at the same time is :

- A. 3 ft
- B. 4 ft
- C. 8 ft
- D. 20 ft

Answer: B



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10. In a right-angles triangle, hypotenuse is  $l$  and the remaining two sides are  $m$  and  $n$ . Then the correct relation is :

A.  $m = + \sqrt{n^2 - l^2}$

B.  $n = + \sqrt{m^2 - l^2}$

C.  $m = + \sqrt{l^2 - n^2}$

D.  $l = + \sqrt{m^2 - n^2}$

Answer: C

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11. In  $\triangle XYZ$  if  $XY^2 - YZ^2 = XZ^2$ , then the hypotenuse and right angled vertex are :

A. XZ and  $\angle X$

B. XY and  $\angle Z$

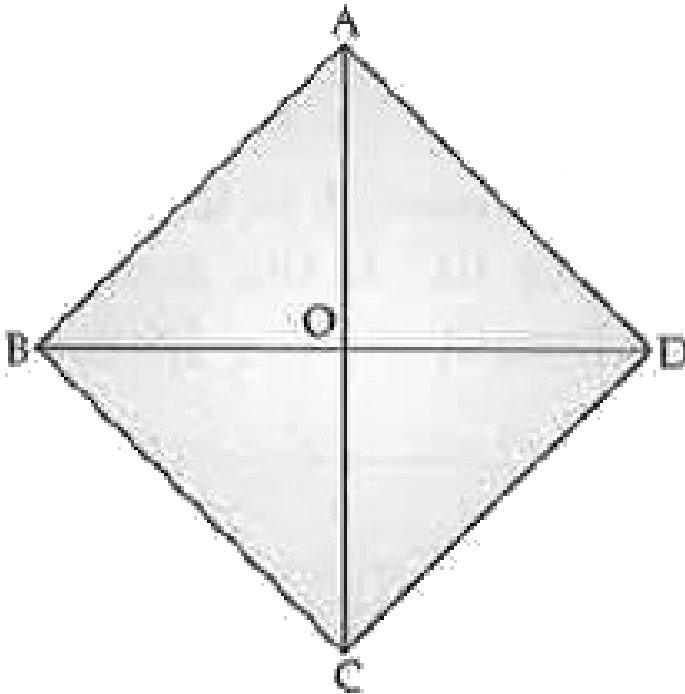
C. YZ and  $\angle X$

D. YZ and  $\angle Y$

Answer: B

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12. In a rhombus ABCD, diagonals intersect at O. The sum of  $AC^2 + BD^2$  are :



A.  $4AB^2$

B.  $4AC^2$

C.  $4BD^2$

D.  $AAC^2$

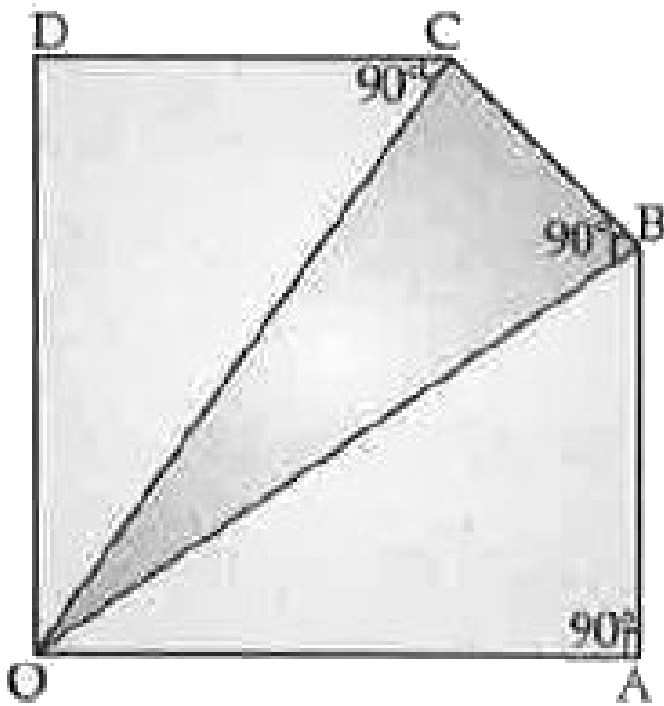
**Answer: A**



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**13. In the figure  $OA = AB = BC = CD = 1$  unit. The unit of**

**$OD$  is :**



A. 1

B. 2

C. 3

D. 4

Answer: B



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14. Which of the following are the side of the right-angles triangle ?

A. 36, 17, 18

B. 20, 30, 10

C. 35, 27, 18

D. 41, 40, 9

Answer: D



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15. In a right-angled triangle  $ABC$ , if  $\angle ABC = 90^\circ$ . Which of the following is correct ?

**A.**  $BC^2 = AC^2 + AB^2$

**B.**  $AC^2 = AB^2 + BC^2$

**C.**  $AB^2 = AB^2 + AC^2$

**D.**  $BC^2 = AB^2 + AC^2$

**Answer: A**

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**16. A vertical pole of 10 cm casts a shadow of 8m at a certain time of the day. The length of the shadow cast by a tower standing next of the pole of height 30 m is :**

**A. 37.5 m**

**B. 36 m**

**C. 32.5 m**

D. 32 m

Answer: A

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## Topic 4 Pythagorean Triplets Very Short Answer Type Questions

1. What is the name given the largest side of a right angled triangle ?

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2. In a  $\Delta PQR$ , N is point on PR such that  $QN \perp PR$ , also  $PN \cdot NR = QN^2$ . Then find  $\angle PQR$

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3. If  $S$  is a point on side  $PQ$  of a  $\triangle PQR$  such that  $PS = QS = RS$ , then find  $PR^2 + QR^2$



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4. A man goes 15 m due west and then 8 m due north. Calculate the distance from the starting point.



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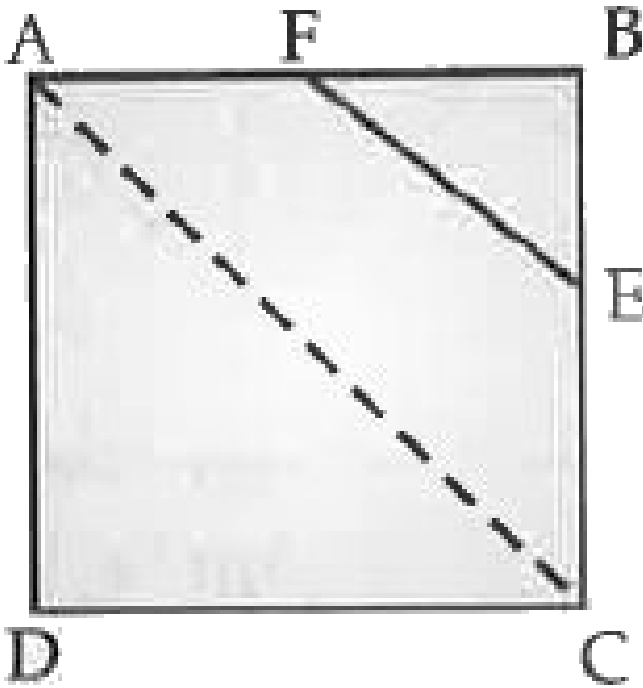
5. A ladder 17 m long reaches a window of a building 15 m above the ground. The distance of the foot of the ladder from the building is?



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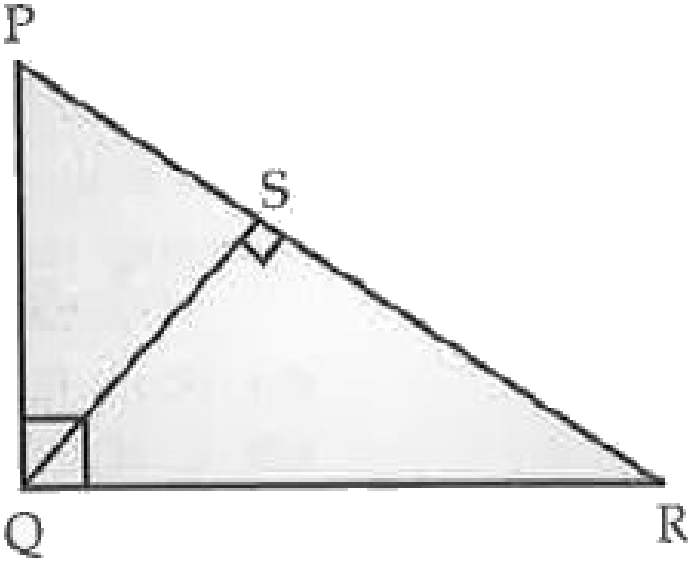
## Topic 4 Pythagorean Triplets Short Answer Type Questions

1. ABCD is square F is the mid-point of AB. BE is one third of BC. If the area of  $\triangle FBE$  is  $108\text{cm}^2$ , Find the length of AC.



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2. In this figure  $\angle PQR = 90^\circ$  and  $QS \perp PR$ . If  $QP = 1.5\text{cm}$  and  $QR = 2\text{cm}$ , calculate the length of  $QS$ .



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3. The sides of right-angled triangle containing the right angle are 5 cm and 12 cm. Find its hypotenuse.

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**4. Find the length of the diagonal of a square of side 12 cm.**

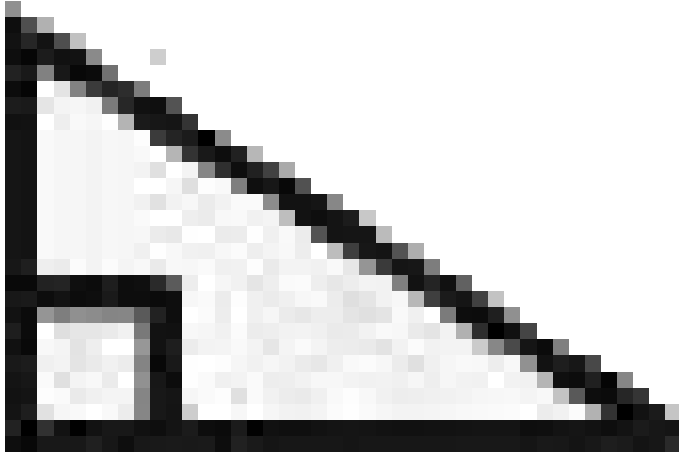


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**5. The length of the diagonal of a rectangular playground is 125 m and length of one side is 75 m. Find the length of the other side.**



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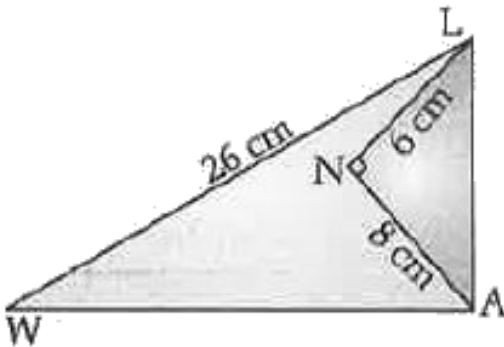


6. In

$\triangle LAW$ ,

$\angle LAW = 90^\circ$ ,  $\angle LNA = 90^\circ$  and  $LW = 26\text{cm}$ ,  $LN = 6\text{cm}$

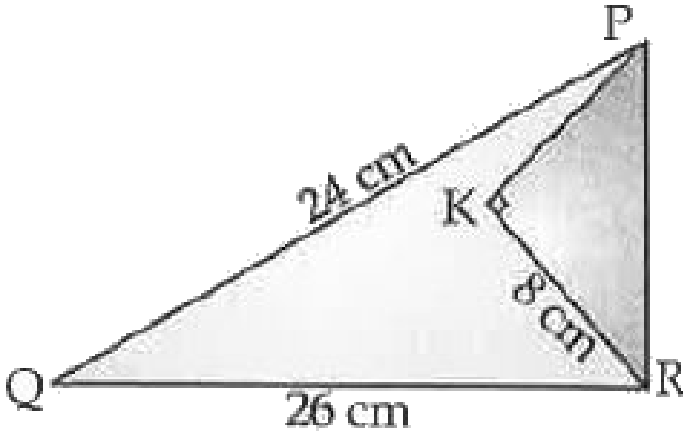
and  $AN = 8\text{cm}$ . Calculate the length of  $WA$ .



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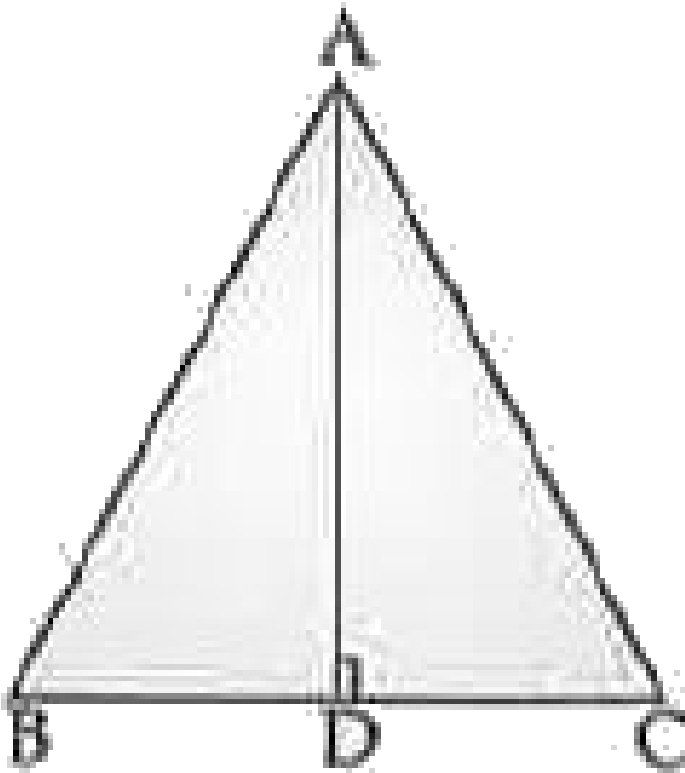


7. In the given triangle  $PQR$ ,  $\angle QPR = 90^\circ$ ,  $PQ = 24\text{cm}$  and  $QR = 26\text{cm}$  and in  $\triangle PKR$ ,  $\angle PKR = 90^\circ$  and  $KR = 8\text{cm}$ , find  $PK$



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8. In an equilateral triangle  $ABC$ ,  $AD$  is drawn perpendicular to  $BC$  meeting  $BC$  in  $D$ . Prove that  $AD^2 = xBD^2$ . Find  $x$ .



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9. A man steadily goes 10 m due east and then 24 m due north.  
Find the distance from the starting point.

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## Topic 4 Pythagorean Triplets Long Answer Type Questions

1. In  $\triangle ABC$ ,  $AB = BC$ ,  $BD$  is the altitude for the base  $AC$  of triangle  $DC = x$  units  $BD = 2x - 1$  units,  $BC = (2x + 1)$  units. Find the measure of the sides of a triangle.

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2. In  $\triangle ABC$ ,  $C$  is a point on  $BD$  such that  $BC:CD=1:2$  and  $\triangle ABC$  is an equilateral triangle Prove that  $AD^2 = 7AC^2$

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3. In  $\triangle ABC$ .  $\angle A = 90^\circ$ ,  $AD \perp BC$  and  $\angle B = 45^\circ$ , If  $AR = x$ , find  $AD$  in terms of  $x$ .

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4. The perimeter of angled triangle is 30 cm and its hypotenuse is 13 cm. Find the length of other two sides of triangle.



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5. ABCD is a trapezium is which  $AB \parallel CD$  and  $BC \perp AB$ . If  $AB = 7.5\text{cm}$ ,  $AD = 13\text{cm}$  and  $CD = 12.5\text{cm}$ , find the length of BC.



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6. A ladder of length  $2.6\text{m}$  is leaned against a wall. When it is at distance of  $2.4\text{m}$  from the foot of the wall, the top of the ladder touches the bottom edge of the window in the wall. It the foot of

the ladder is moved  $1.4m$  towards the wall, it touches the top edge of the window. Find the height of the window.

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7. In  $\triangle ABC$   $\angle BAC = 90^\circ$   $\angle B : \angle C = 1 : 2$  and  $AC = 4cm$ .

Calculate the length of DB.

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## Topic 4 Pythagorean Triplets Long Answer Type Questions li

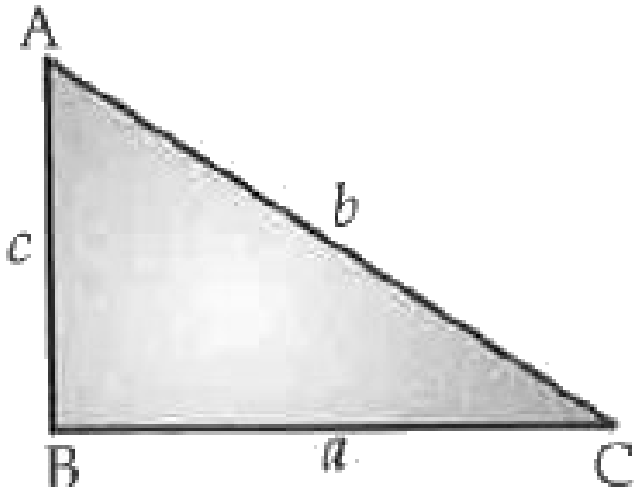
1. Prove that "In a right triangle, the square of the hypotenuse is equal to the sum of squares of the other two sides".

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2. Derive the formula for height and area of an equilateral triangle.

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3. In  $\triangle ABC$ ,  $a + b = 18$  units,  $b + c = 25$  units and  $c + a = 17$  units. What type of triangle is ABC? Give reason.



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## Topic 5 Pythagoras Theorem Short Answer Type Questions

1. In the given figure ,  $BD \perp AC$  .Prove that

$$AB^2 + CD^2 = AD^2 + BC^2$$

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## Topic 5 Pythagoras Theorem Long Answer Type Questions

1. In  $\triangle ABC$ ,  $BD:CD = 3:1$  and  $AD \perp BC$ . Prove that

$$2(AB^2 - AC^2) = BC^2.$$

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2. In an equilateral triangle  $ABC$ ,  $AD \perp BC$ . Prove that :

$$AB^2 + CD^2 = \frac{5}{4}AC^2$$



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3.  $\triangle ABC$  is a right angled triangle with  $\angle C = 90^\circ$ ,

$BC = a$ ,  $AC = b$ ,  $CD \perp AB$  and  $CD = p$ . Show that

$$\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$$



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4.  $ABCD$  is a rhombus. Prove that  $AC^2 + BD^2 = 4AB^2$



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Topic 5 Pythagoras Theorem Long Answer Type Questions li



1. In a right angled triangle, square on the hypotenuse is equal to sum of the squares on the other sides. Prove the statement.

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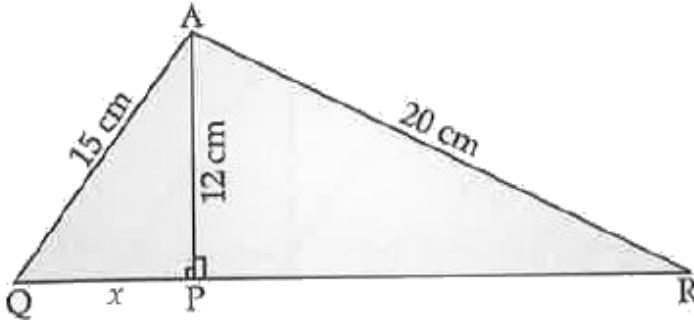
2. "If the square on the longest sides of a triangle is equal to the sum of the squares on the other two sides then those two sides contain a right angle." Prove.

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3. In  $\triangle ABC$ ,  $CD \perp AB$ ,  $CA = 2AD$  and  $BD = 3AD$ . Prove that  $\angle BCA = 90^\circ$

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4. The shortest distance AP from a point 'A' to QR is 12 cm. Q and R are respectively 15 cm and 20 cm from 'A' and on opposite sides of AP. Prove that  $\angle QAR = 90^\circ$



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### Textbook Corner Exercise 2 1

1. Fill in the blank using the correct word given in brackets :

(i) All circle are \_\_\_ (congruent, similar)

(ii) All squares are \_\_\_ (similar, congruent)

(iii) All \_\_\_ triangles are similar.(isosceles, equilateral)

(iv) Two polygons of the same number of sides are similar, if (a)

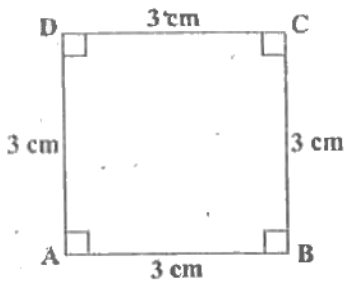
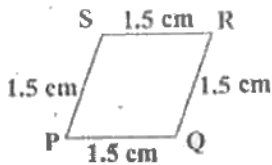
their corresponding angles are \_\_\_\_ and (b) their corresponding sides are \_\_\_\_ . (equal, proportional)

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2. Give two different examples of pair of similar figures.

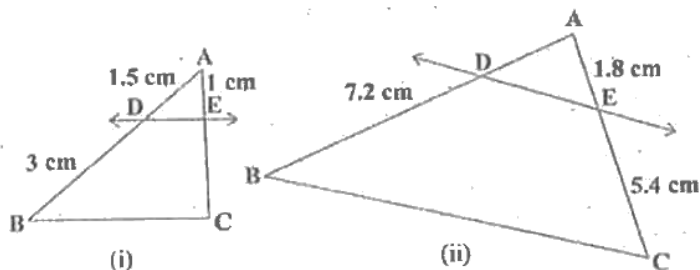
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3. State whether the following quadrilaterals are similar or not:



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1. In Fig, (i) and (ii),  $DE \parallel BC$ . Find EC in (i) and AD in (ii).



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2. E and F are points on the sides PQ and PR respectively of  $\triangle PQR$ . For each of the following cases, state whether  $EF \parallel QR$ :

(i)  $PE = 3.9\text{cm}$ ,  $EQ = 3\text{cm}$ ,  $PF = 3.6\text{cm}$ ,  $FR = 2.4\text{cm}$

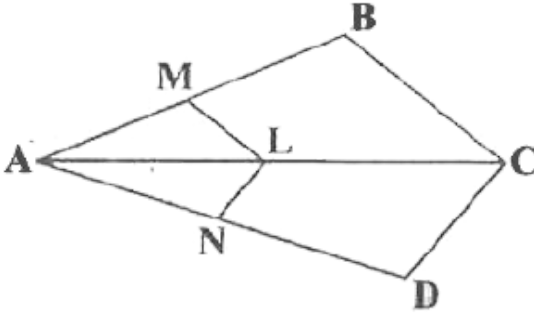
(ii)  $PE = 4\text{cm}$ ,  $QE = 4.5\text{cm}$ ,  $PF = 8\text{cm}$ ,  $RF = 9\text{cm}$

(iii)

$PQ = 1.28\text{cm}$ ,  $PR = 2.56\text{cm}$ ,  $PE = 0.18\text{cm}$ ,  $PF = 0.36\text{cm}$

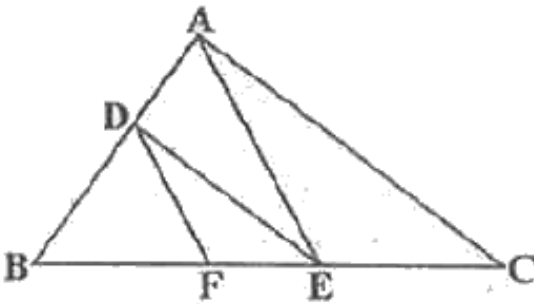
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3. In Fig.  $LM \parallel CB$  and  $LN \parallel CD$ , prove that  $\frac{AM}{AB} = \frac{AN}{AD}$ .



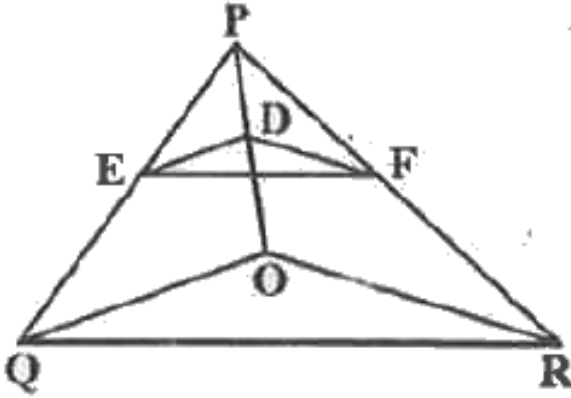
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4. In Fig  $DE \parallel AC$  and  $AE$ . Prove that  $\frac{BF}{FE} = \frac{BE}{EC}$



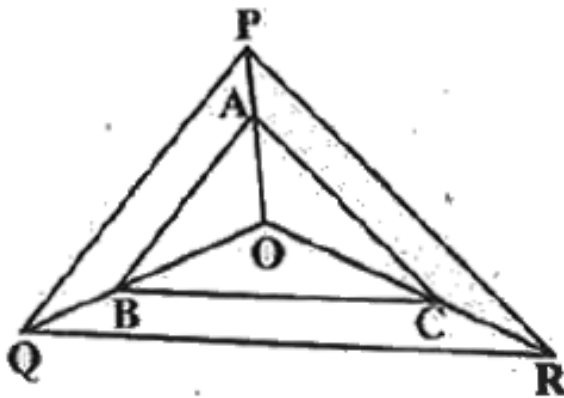
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5. In Fig  $DE \parallel OQ$  and  $DF \parallel OR$ . Show that  $EF \parallel QR$ .



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6. In Fig A, B and C are points on OP, OQ and OR respectively such that  $AB \parallel PQ$  and  $AC \parallel PR$ . Show that  $BC \parallel QR$ .



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7. Using Theorem , prove that a line drawn through the mid- point of one side of a triangle parallel to another side bisects the third side .( Recall that you have proved it in class IX).

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8. Using Theorem , prove that the line joining the mid-point of any two sides of a triangle is parallel to the third side. ( Recall

that you have done it is class IX) .

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9. ABCD is a trapezium in which  $AB \parallel DC$  and its diagonals intersect each other at the point O. Show that  $\frac{AO}{BO} = \frac{CO}{DO}$

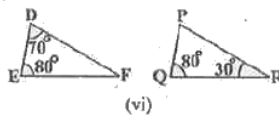
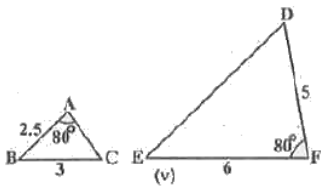
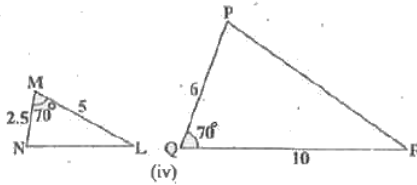
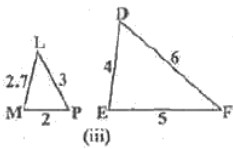
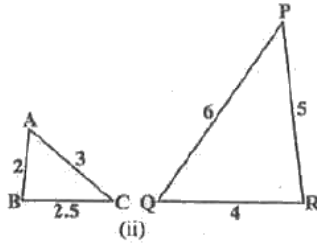
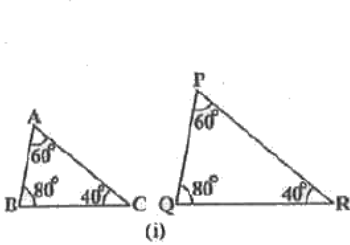
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10. The diagonals of a quadrilateral ABCD intersect each other at the point O such that  $\frac{AO}{BO} = \frac{CO}{DO}$  show that ABCD is a trapezium.

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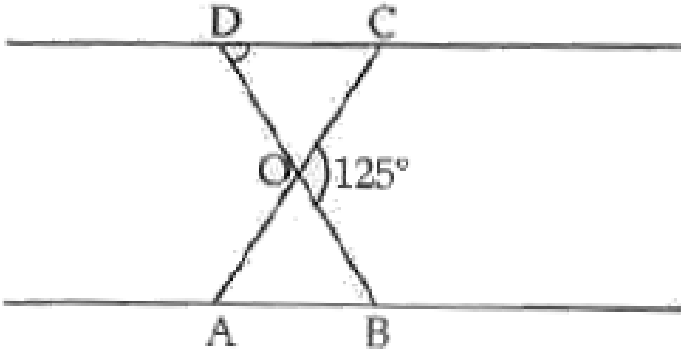


1. State which pairs of triangles in Fig are similar. Write the similarity criterion used by you for answering the question also write the pairs of similar triangles in the symbolic form:



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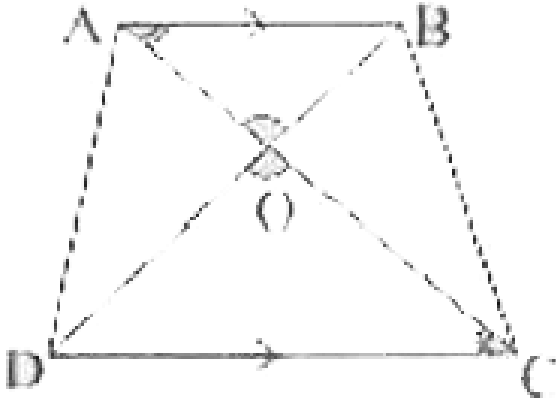
2. In the figure given below,  $\triangle ODC \sim \triangle OBA$ ,  $\angle BOC = 125^\circ$  and  $\angle CDO = 70^\circ$ . Find  $\angle DOC$ ,  $\angle DCO$  and  $\angle OAB$



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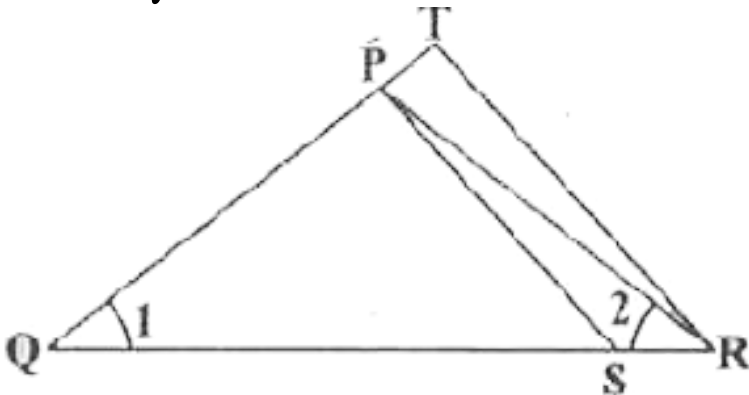
3. Diagonals AC and BD of a trapezium ABCD with  $AB \parallel DC$  intersect each other at the point O. using a similarity criterion for

two triangles, show that  $\frac{OA}{OC} = \frac{OB}{OD}$ .



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4. In Fig.  $\frac{QR}{QS} = \frac{QT}{PR}$  and  $\angle 1 = \angle 2$ . Show that  $\triangle PQS \sim \triangle TQR$ .



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5. S and T are point on sides  $PR$  and  $QR$  of  $\triangle PQR$  such that  $\angle P = \angle RTS$ . Show that  $\triangle RPQ \sim \triangle RTS$ .

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6. In Fig. If  $\triangle ABE \cong \triangle ACD$ , show that  $\triangle ADE \sim \triangle ABC$ .

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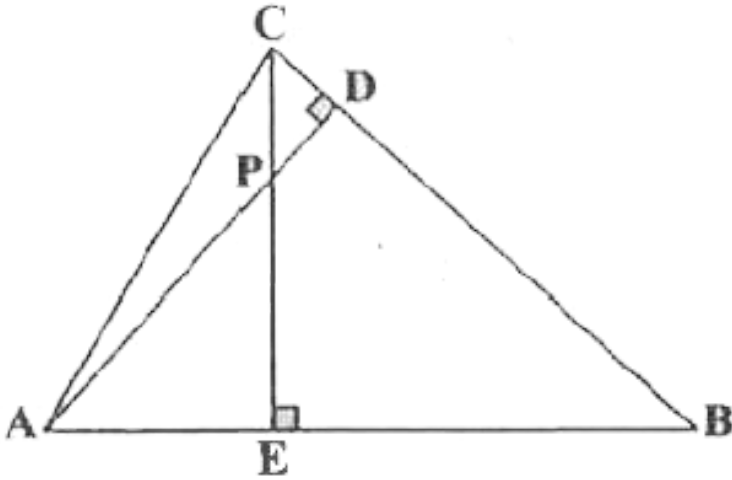
7. In Fig. Altitudes  $AD$  and  $CE$  of  $\triangle ABC$  intersect each other at the point  $P$ . Show that :

(i)  $\triangle AEP \sim \triangle CDP$

(ii)  $\triangle ABD \sim \triangle CBE$

(iii)  $\triangle AEP \sim \triangle ADB$

(iv)  $\Delta PDC \sim \Delta BEC$



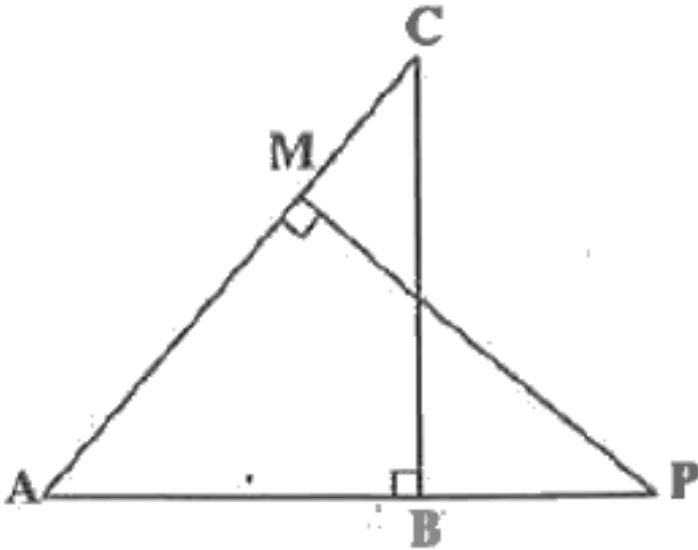
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8. E is a point on the side AD produced of a parallelogram ABCD and BE intersects CD at F. show that  $\Delta ABE \sim \Delta CFB$

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9. In Fig , ABC and AMP are two right triangles, right angled at B and M respectively. Prove that :

$$\Delta ABC \sim \Delta AMP$$



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10. GD and GH are respectively the bisectors of  $\angle ACB$  and  $\angle EGF$  such that D and H lie on sides AB and FE of

$\triangle ABC$  and  $\triangle EFG$  respectively. If  $\triangle ABC \sim \triangle FEG$ , show

that:

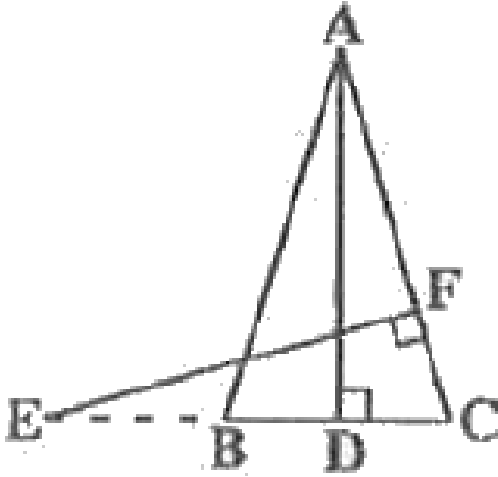
$$\frac{CD}{GH} = \frac{AC}{FG}$$



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11. In Fig E is a point on side CB produced of an isosceles triangle ABC with  $AB=AC$ . If  $AD \perp BC$  and  $EF \perp AC$ , prove that

$$\triangle ABD \sim \triangle ECT$$

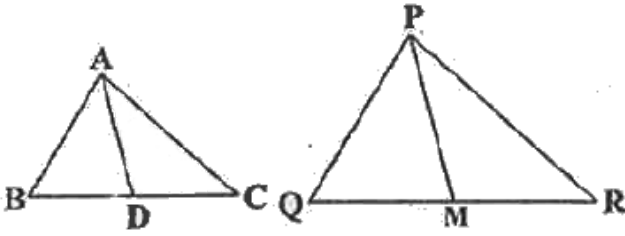


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12. sides AB and BC and median AD of a triangle ABC are respectively proportional to side PQ and QR median PM of



$\Delta PQR$  (see Fig ). Show that  $\Delta ABC \sim \Delta PQR$



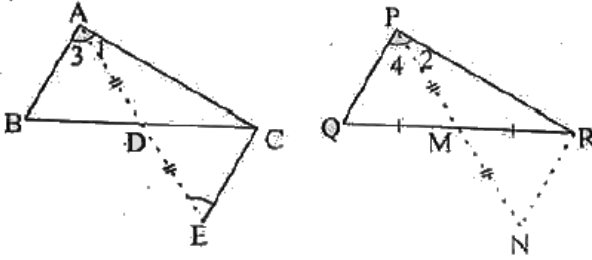
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13. D is a point on the side BC of a triangle ABC such that  $\angle ADC = \angle BAC$  . Show  $CA^2 = CB \cdot CD$

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14. side AB and AC and median AD of a triangle ABC are respectively proportional to side PQ and PR and median PM of

another triangle  $PQR$ . Show that  $\triangle ABC \sim \triangle PQR$



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15. A vertical pole of height 6m casts a shadow 4m long on the ground, and at the same time a tower on the same ground casts a shadow 28m long. Find the height of the tower.

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16. If  $AD$  and  $PM$  are median of triangles  $ABC$  and  $PQR$  respectively

where  $\triangle ABC \sim \triangle PQR$ , prove that  $\frac{AB}{PQ} = \frac{AD}{PM}$ .

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## Textbook Corner Exercise 2 4

1. Let  $\triangle ABC \sim \triangle DEF$  and their areas be , respectively ,  $64\text{cm}^2$  and  $121\text{cm}^2$  . If  $EF = 15.4$  cm, find BC

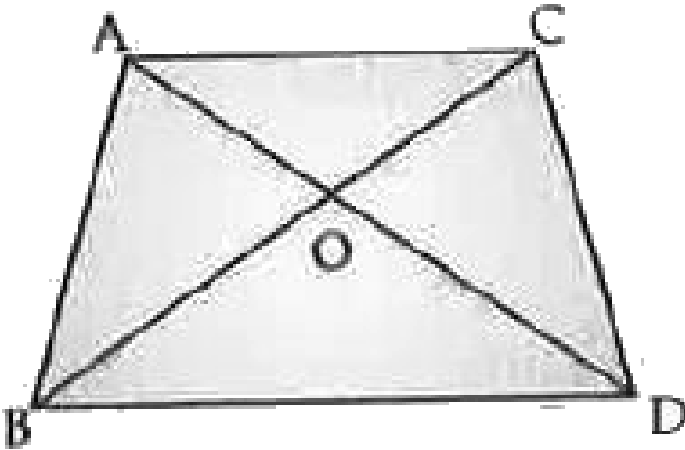
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2. Diagonals of a trapezium ABCD with  $AB \parallel DC$  intersect each other at the point O. If  $AB = 2 CD$  , find the ratio of the areas of triangles AOB and COD.

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3. In the figure given below, ABC and DBC are two triangles on the same base BC. If AD intersects BC at O, show that

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



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4. D, E and F are respectively the mid-points of the sides AB, BC and CA of a  $\Delta ABC$ . Prove that by joining these mid-points D, E and F, the  $\Delta ABC$  is divided into four congruent triangles

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5. Prove that the ratio at the areas of two similar triangles is equal to the square of the ratio of their corresponding medians.

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

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7. ABC and BDF are two equilateral triangles such that D is the mid -point of BC. Ratio of the areas of triangles ABC and BDF is

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

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### Textbook Corner Exercise 2 5

1. Sides of triangles are given below. Determine which of them are right triangles.

In case of a right triangle , write the length of its hypotenuse.

7cm, 24 cm, 25 cm

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2. PQR is a triangle right angled at P and M is a point on QR such that  $PM \perp QR$ . Show that  $PM^2 = QM \cdot MR$ .

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3. In Fig. ABD is a triangle right angled at A and  $AC \perp BD$  show that

(i)  $AB^2 = BC \cdot BD$ , (ii)  $AC^2 = BC \cdot DC$ , (iii)  $AD^2 = BD \cdot CD$

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4. ABC is an isosceles triangle right angled at C. Prove that  $AB^2 = 2AC^2$ .

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5.  $ABC$  is an isosceles triangle right angled at  $C$  . Prove that

$$AB^2 = 2AC^2 .$$

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6.  $ABC$  is an equilateral of side  $2a$  . Find each of its altitudes.

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7. Prove that sum of the squares of the side of a rhombus is equal to the to the sum of the squares of its diagonals.

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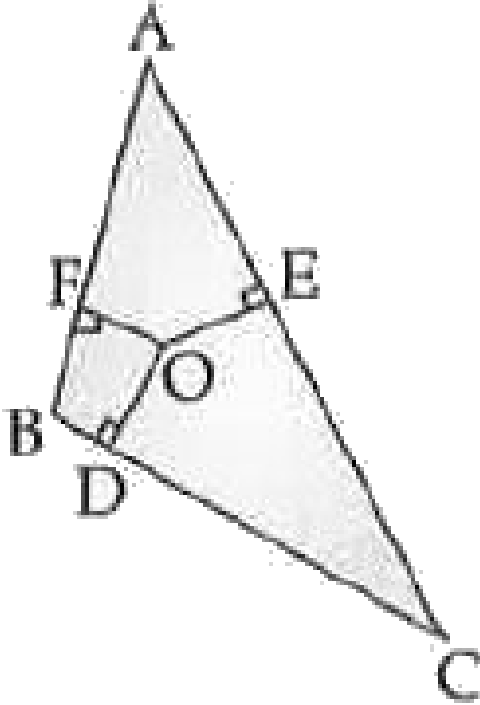
8. In the figure given below,  $O$  is point in the interior of a triangle  $ABC$ ,  $OD \perp BC$ ,  $OE \perp AC$  and  $OF \perp AB$ . Show that



(i)

$$OA^2 + OB^2 + OC^2 + OD^2 - OE^2 - OF^2 = AR^2 + BD^2 + CE^2$$

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



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9. A ladder 10 m long reaches a window 8 m above the ground.

Find the distance of the foot of the ladder from base of the wall.



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10. A guy wire attached to a vertical pole of height 18 m is 24 m 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 ?

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11. An aeroplane leaves an airport and flies due north at a speed of 1,000 km per hour. At the same time, another aeroplane leaves the same airport and flies due west at a speed of 1,200 km per hour. How far apart will be the two planes after  $1\frac{1}{2}$  hours?

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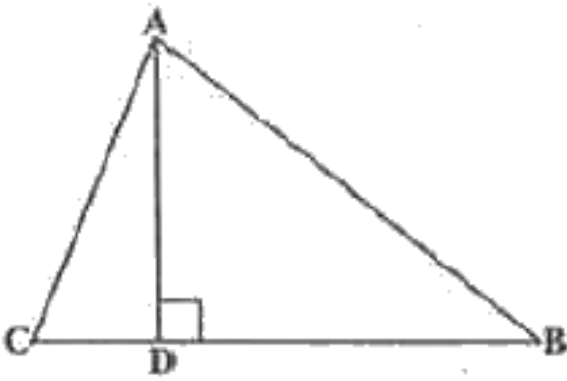
12. Two poles of heights 6 m and 11 m stand on a plane ground. If the distance between the feet of the poles is 12m , find the distance between their tops .

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13. D and E are points on the sides CA and CB respectively of a triangle ABC right angled at C. prove that  $AE^2 + BD^2 = AB^2 + DE^2$ .

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14. The perpendicular from A on side BC of a  $\triangle ABC$  intersects BC at D such that  $DB = 3 CD$  . Prove that  $2 AB^2 = 2 AC^2 + BC^2$



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

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16. 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.

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17. Tick the correct answer and justify : In

$\Delta ABC$ ,  $AB = 6\sqrt{3}cm$ ,  $AC = 12cm$  and  $BC = 6cm$

The angle B is :

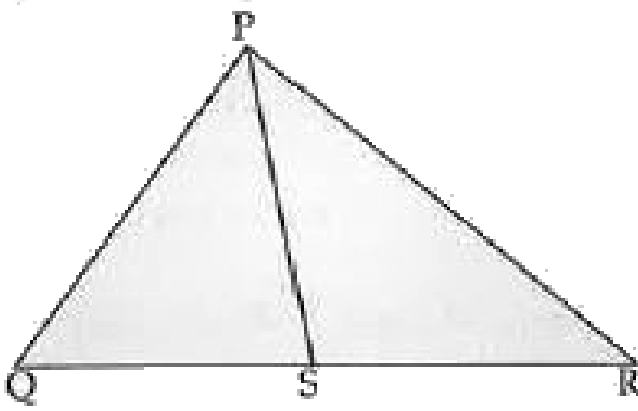


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### Textbook Corner Exercise 2 6

1. In the figure given below, PS is the bisector of  $\angle QPR$  of

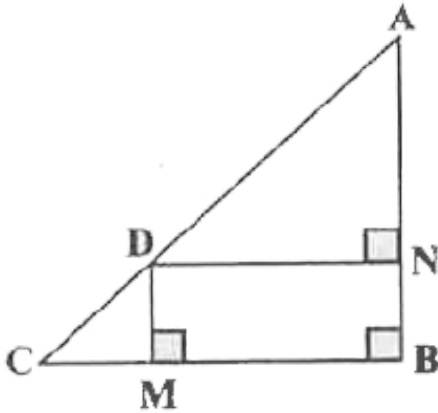
$\Delta PQR$ . Prove that  $\frac{QS}{SR} = \frac{PQ}{PR}$



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2. In Fig. D is point on hypotenuse AC of  $\triangle ABC$ ,  $BD \perp AC$ ,  $DM \perp BC$  and  $DN \perp AB$ . Prove that :

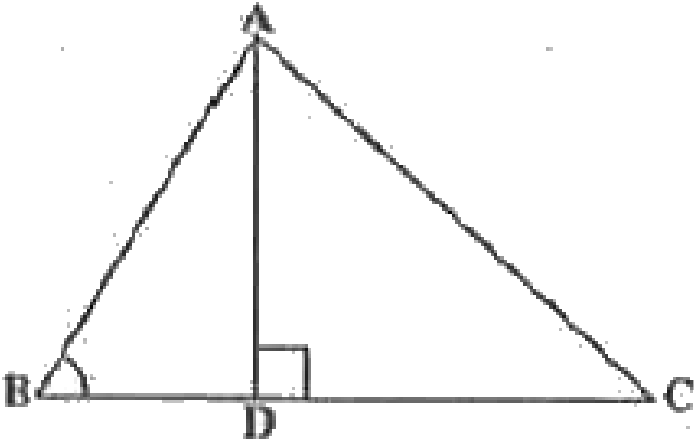
(i)  $DM^2 = DN \cdot MC$ , (ii)  $DN^2 = DM \cdot AN$



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3. In Fig .  $ABC$  is a triangle in which  $\angle ABC < 90^\circ$  and  $AD \perp BC$ . Prove that

$$AC^2 = AB^2 + BC^2 - 2BC \cdot BD.$$

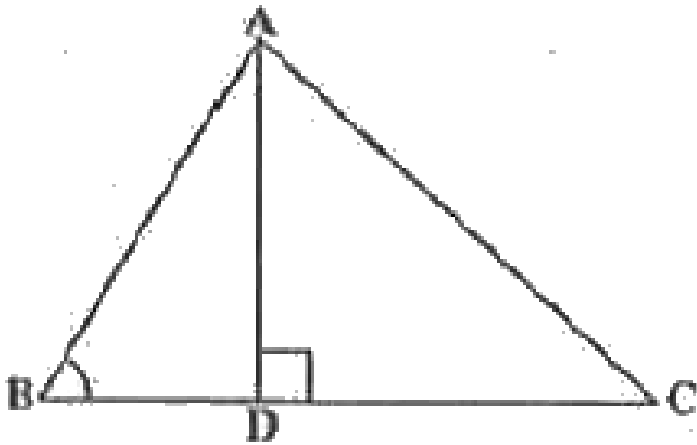


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4. In Fig .  $ABC$  is a triangle in which  $\angle ABC < 90^\circ$  and  $AD \perp BC$ . Prove that



$$AC^2 = AB^2 + BC^2 - 2BC \cdot BD.$$

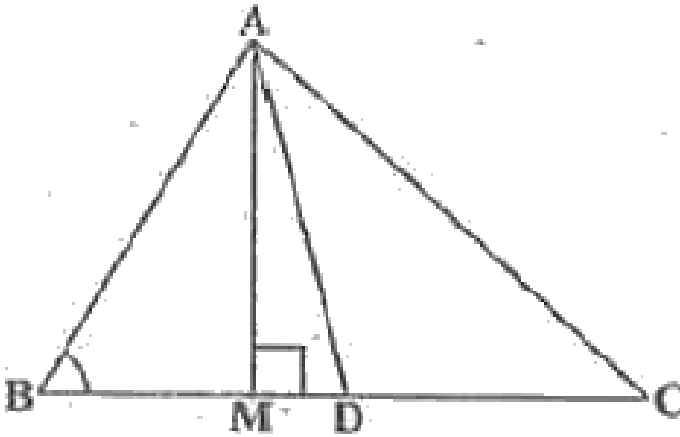


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5. In Fig . AD is a median of a triangle  $ABC$  and  $AD \perp BC$ .

Prove that :

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



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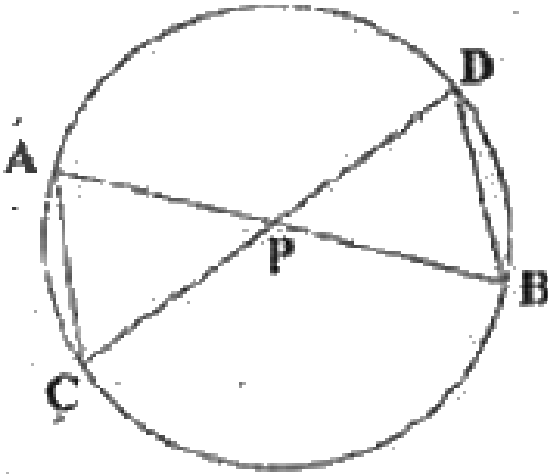
6. Prove that the sum of the squares of the diagonals of parallelogram is equal to sum of the squares of its sides.

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7. In Fig . two chords AB and CD intersect each other at the point

P. prove that :

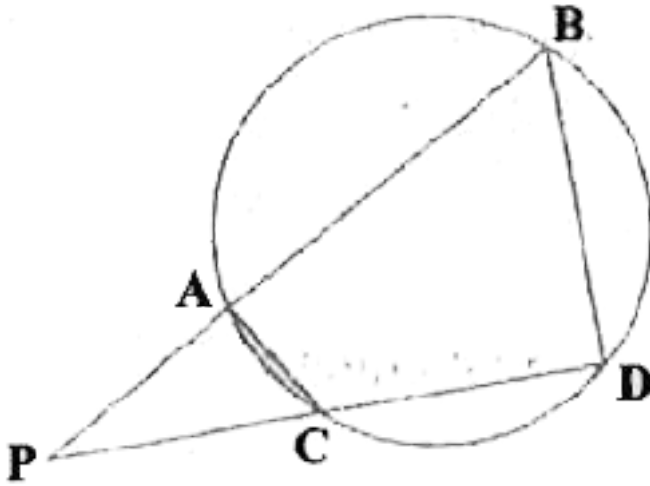
$$\triangle APC \sim \triangle DPB$$



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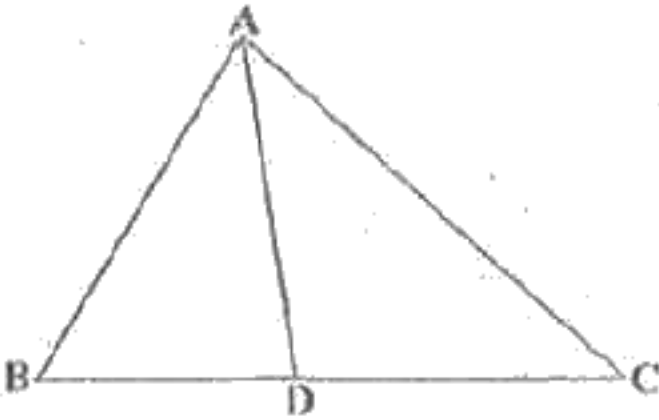
8. In Fig. two chords AB and CD of a circle intersect each other at the point P (when produced) outside the circle. Prove that (i)

$\Delta PAC \sim \Delta PDB$ , (ii)  $PA \cdot PB = PC \cdot PD$



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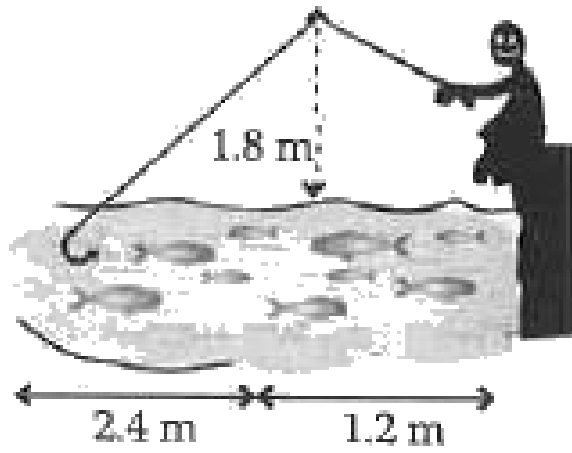
9. In Fig .D is a point on side BC of  $\Delta ABC$  such that  $\frac{BD}{CD} = \frac{AB}{AC}$   
prove that AD is the bisector of  $\angle BAC$ .



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10. Nazima is fly fishing in a stream. The tip of her fishing rod is  $1.8m$  above the surface of water and the fly at the end of the string rests on the water  $3.6m$  away and  $2.4m$  from a point directly under the tip of the rod. Assuming that her rod to the fly) is taut, how much string does she have out(see fig)? If she pulls in the string at the rate of  $5\text{ cm}$  per second, what will be the

horizontal distance of the fly from her after 12 seconds.



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