MATHS

BOOKS - BAL BHARTI

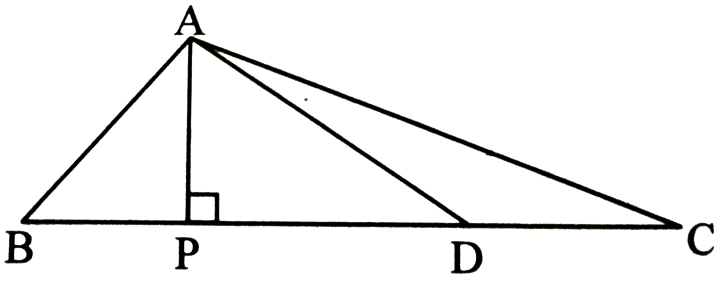
SIMILARITY

Examples

1. In ΔABC,point D is on side BC such that DC = 6, BC = 15. find

(i) $A(\Delta ABD) : A(\Delta ABC)$ and

(ii) $A(\Delta ABD) : A(\Delta ADC)$.



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Solved Examples

1.

$\Delta ABC \sim \Delta PQR$, $A(\Delta ABC) = 16$, $A(\Delta PQR) = 25$,

then infd the value of ration $\frac{AB}{PQ}$.

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2. Ratio of corresponding sides of two similar triangles is 2 : 5.

if the area of the smaller triangle is 64sq. Cm , then what is the area

of the bigger triangle?

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3. In $\square ABCD$, AB||CD. Diagonals AC and BD intersect each other at point P. Prove that $A(\triangle ABP)$: $A(\triangle CPD)=(AB)^2:(CD)^2$.

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Practice Set 1 1

1. Base of a triangle is 9 cm and height is 5 cm. Base of another triangle is 10 cm and height is 6 cm. Find the ratio of areas of these triangles.

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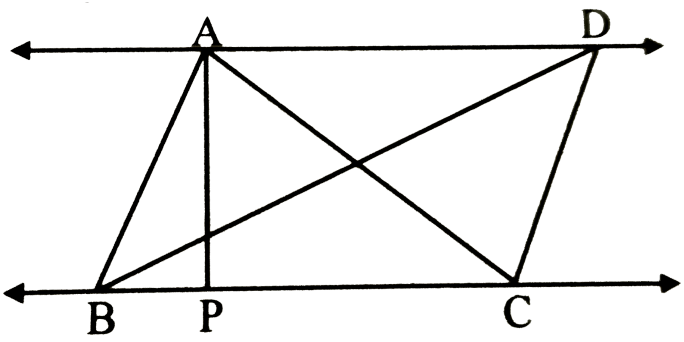
2. In the adjoining figure, $AP \perp BC, AD||BC$, then find $A(\Delta ABC) : A(\Delta BCD)$.



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3. In the given figure, in ΔABC, point D is on side AC. If

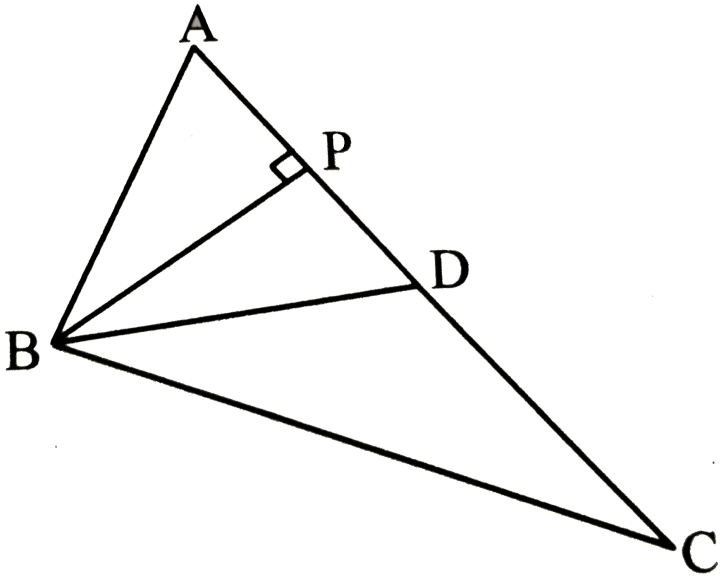
AC = 16,

DC = 9 and BP $\perp$ AC then, find the following rations.

i. $\frac{A(\Delta ABD)}{A(\Delta ABC)}$

ii. $\frac{A(\Delta BDC)}{A(\Delta ABC)}$

iii. $\frac{A(\Delta ABD)}{A(\Delta BDC)}$



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Practice Set 1 2

1. In ΔMNP, NQ is a biscetor of $\angle N$. If MN = 5, PN = 7, MQ = 2.5, then find QP.

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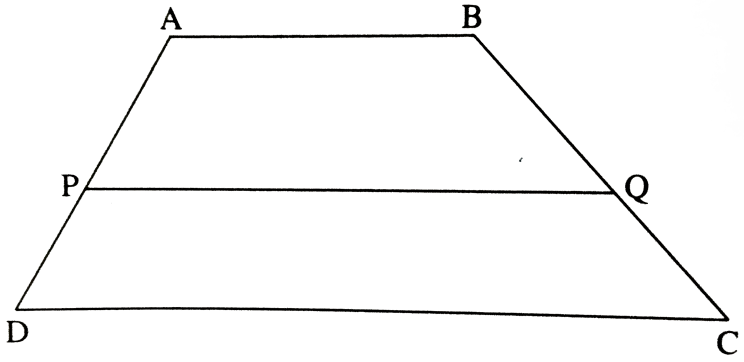
2. In trapezium ABCD side $AB \mid\mid$ side $PQ \mid\mid$ side DC, $AP = 15$, $PD = 12$, $QC = 14$, find BQ.



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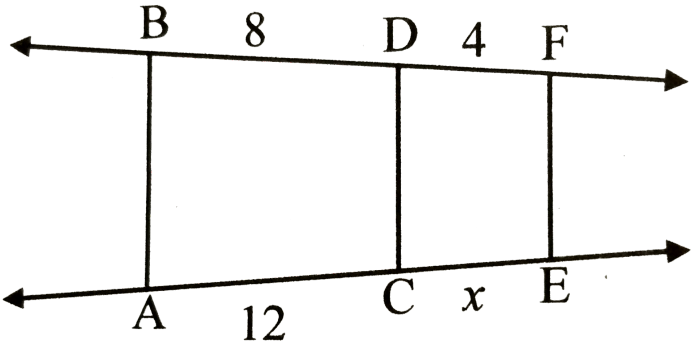
3. In the adjoining figure, if $AB||CD||FE$, then find x and AE.



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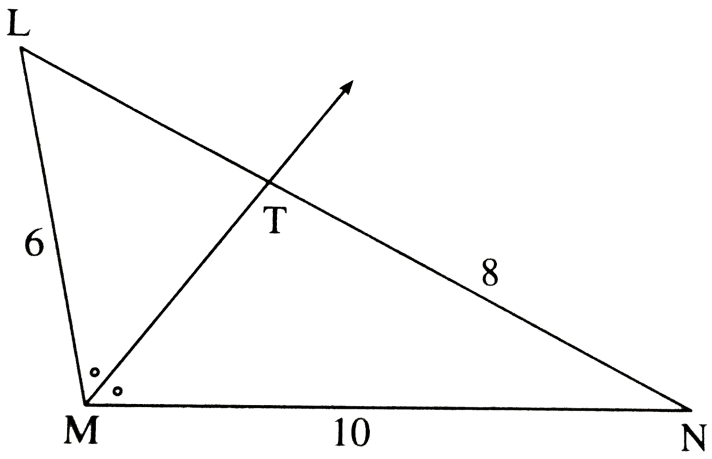
4. In ΔLMN, ray MT bisects $\angle LMN$. If $LM = 6, MN = 10$.

$TN = 8$ then find LT.



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5. In ΔABC,ray BD bisects $\angle ABC$ and ray CE bisects $\angle ACB$.

If seg AB $\cong$ seg AC, then prove that ED $||$ BC.

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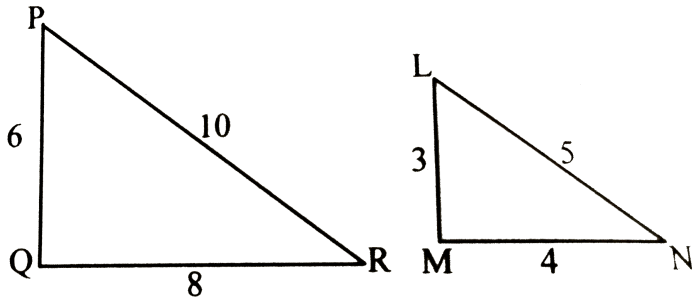
Practice Set 1 3

1. Are the triangle in the adjoining figure similar? If yes, by which test?



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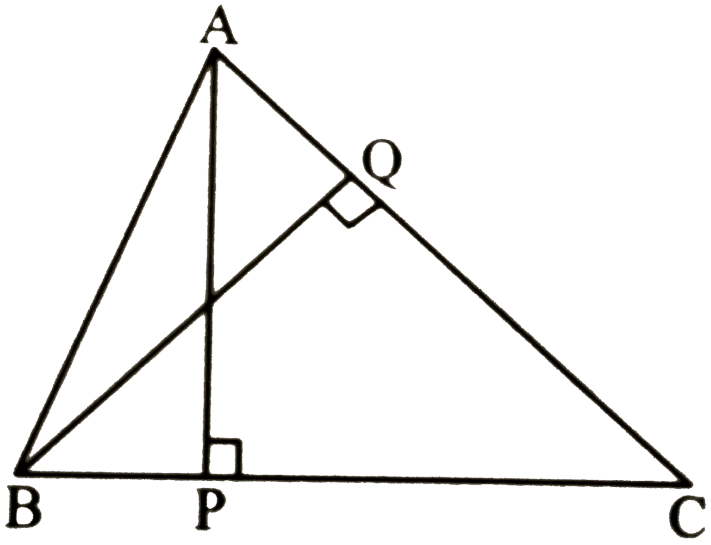
2. In $\Delta ABC, AP \perp BC, BQ \perp AC, B - P - C, A - Q - C,$ then prove that $\Delta CPA \sim \Delta CQB$. If AP = 7, BQ = 8, BC =

12, then find AC.



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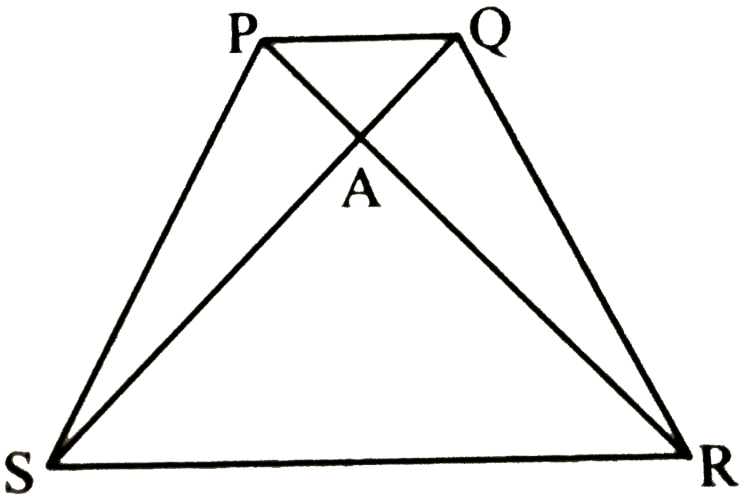
3. Given : In trapezium PQRS, side PQ||SR, AR = 5 AP, AS = 5 AQ, then prove that SR=5 PQ.



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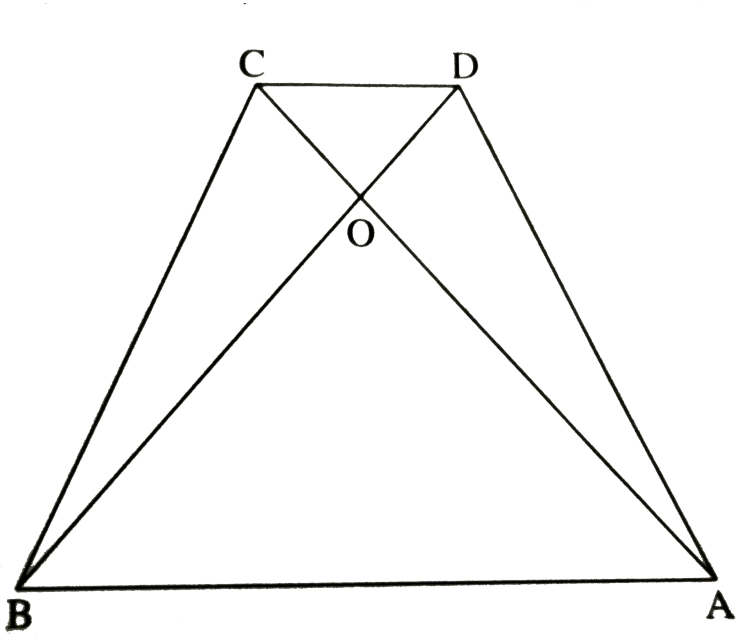
4. In trapezium ABCD side $AB \mid\mid$ side DC, diagonals AC and BD intersect In point O. If $AB = 20, DC = 6, OB = 15$

then find OD.



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5. $\square ABCD$ is a parallelogram. Point E is on side BC. Line DE intersects Ray AB in point T. Prove that $DE \times BE = CE \times TE$.

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6. In the figure, seg AC and seg BD intersect each other in point P and $\frac{AP}{CP} = \frac{BP}{DP}$. Prove that $\Delta ABP \sim \Delta CDP$.

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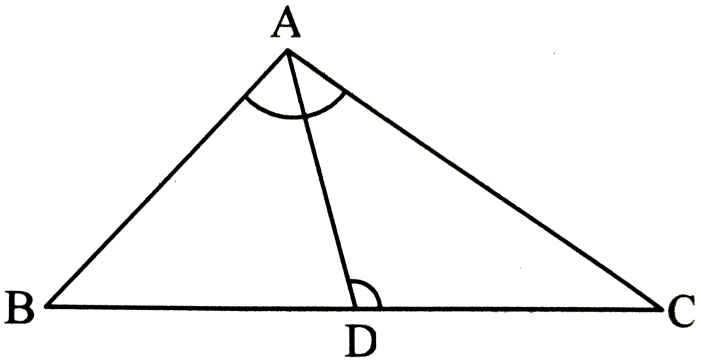
7. In the adjoining figure, in ΔABC, point D is on side BC such that, $\angle BAC = \angle ADC$. Prove that,

$CA^2 = CB \times CD.$



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Practice Set 1 4

1. Ratio of corresponding sides of two similar triangles is 3:5, then find ratio of their areas.

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2. If

$\Delta ABC \sim \Delta PQR$, $A(\Delta ABC) = 80$, $A(\Delta PQR) = 125$,

then

fill in the blanks:

$$\frac{A(\Delta ABC)}{A(\Delta \ldots\ldots\ldots)} = \frac{80}{125} \therefore \frac{AB}{PQ} = \frac{\square}{\square}$$

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$\Delta ABC \sim \Delta PQR$, $A(\Delta ABC) = 80$, $A(\Delta PQR) = 125$,

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fill in the blanks:

$$\frac{A(\Delta ABC)}{A(\Delta \ldots\ldots\ldots)} = \frac{80}{125} \therefore \frac{AB}{PQ} = \frac{\square}{\square}$$

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4.

$\Delta LMN \sim \Delta PQR, 9 \times A(\Delta PQR) = 16 \times A(\Delta LMN).$

If QR = 20, then find MN.

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5. Areas two similar triangles are 225 sq.cm, 81 sq.cm. If a side of the smaller triangle is 12 cm, then find corresponding side of bigger triangle.

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6. Choose the correct alternative.

ΔABC and ΔPQR are equilateral triangles. If $A(\Delta ABC) : A(\Delta PQR)$ = 1 : 16, and AB = 2 cm, then what is the length of PR?

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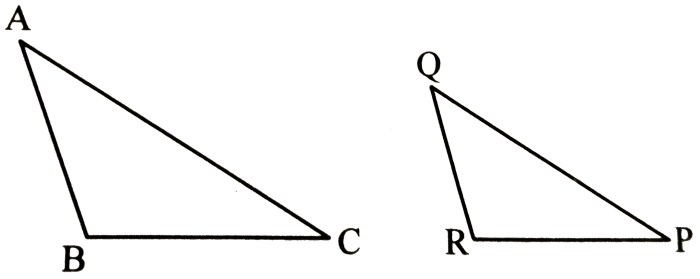
Problem Set 1

1. In ΔABC and ΔPQR, in a one to one correspondence.

$\frac{AB}{QR} = \frac{BC}{PR} = \frac{CA}{PQ}$, then



A. $\Delta PQR \sim \Delta ABC$

B. $\Delta PQR \sim \Delta CAB$

C. $\Delta CBA \sim \Delta PQR$

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

Answer: B

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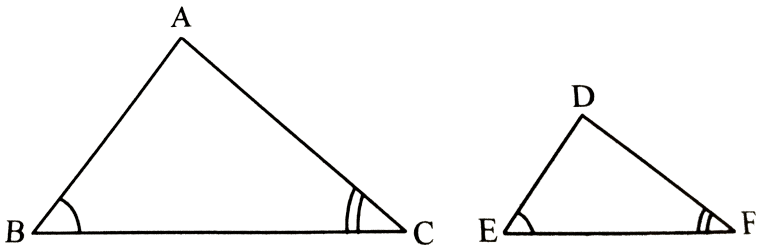
2. In ΔABC and ΔDEF, $\angle B = \angle E, \angle F = \angle C$ and

$AB = 3DE$, then which of the statements regarding the two

triangles is true?



A. The triangles are not congruent and not similar

B. The triangles are similar but not congruent.

C. The triangles are congruent and similar.

D. None of the statements above is true.

Answer: B

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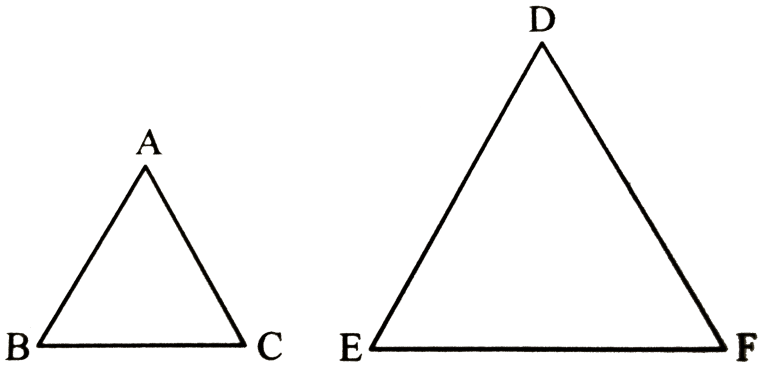
3. ΔABC and ΔDEF are equlateral triangles. $A(\Delta ABC) : A(\Delta DEF)$ = 1 : 2. If AB = 4 , then what is length of DE?



A. $2\sqrt{2}$

B. 4

C. 8

D. $4\sqrt{2}$

Answer: D

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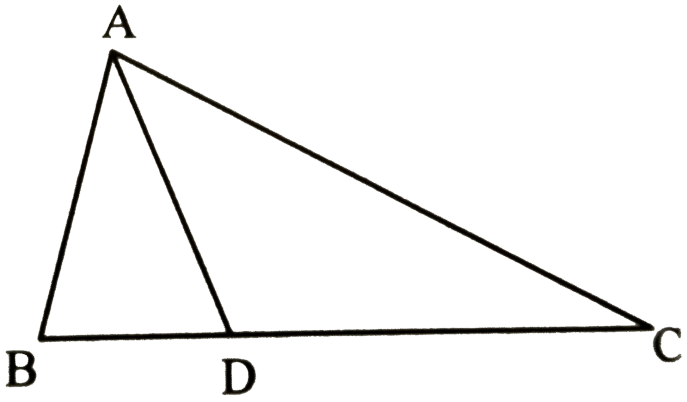
4. In ΔABC, $B - D - C$ and $BD = 7, BC = 20$,

then

find following rations.

$$\frac{A(\Delta ADC)}{A(\Delta ABC)}$$



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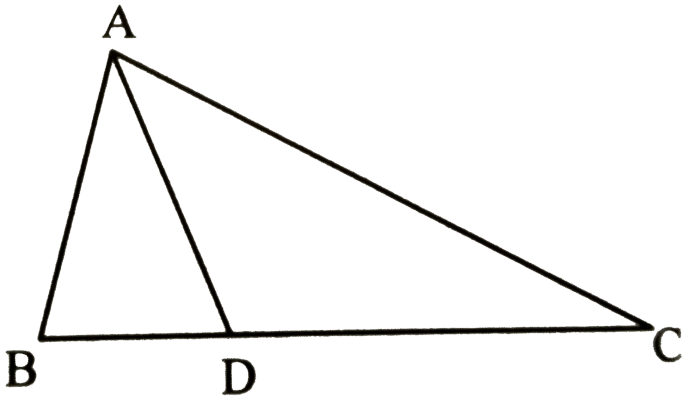
5. In ΔABC, $B - D - C$ and $BD = 7, BC = 20$,

then

find following rations.

$$\frac{A(\Delta ADC)}{A(\Delta ABC)}$$



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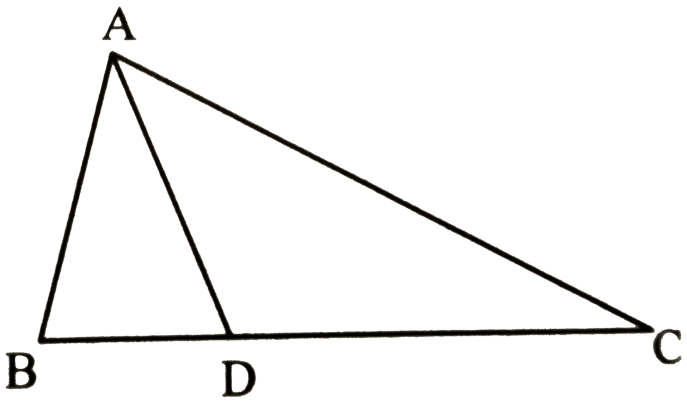
6. In ΔABC, $B - D - C$ and $BD = 7, BC = 20$,

then

find following rations.

$$\frac{A(\Delta ADC)}{A(\Delta ABC)}$$



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7. Ratio of areas of two triangles with equal height is 2:3. If base of smaller triangle is 6 cm then find the corresponding base of the bigger triangle.

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8. $\Delta MNT \sim \Delta QRS$. Length of altitude drawn from point T is 5 and length of altitude drawn from point S is 9. Find the ratio

$$\frac{A(\Delta MNT)}{A(\Delta QRS)}.$$

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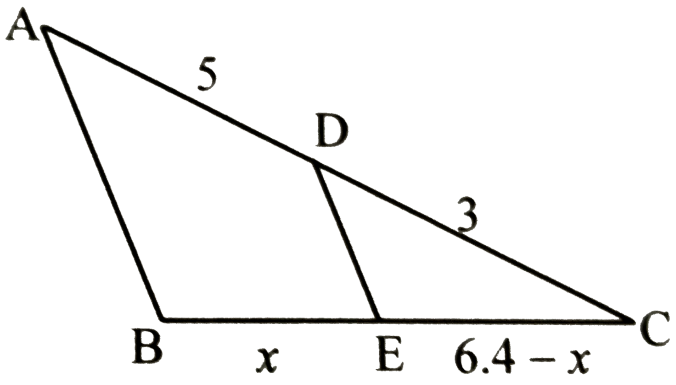
9. In the adoining figure, A - D - C and B - E -C . Seg DE || side AB. If AD = 5, DC = 3, BC = 6.4, then find BE.



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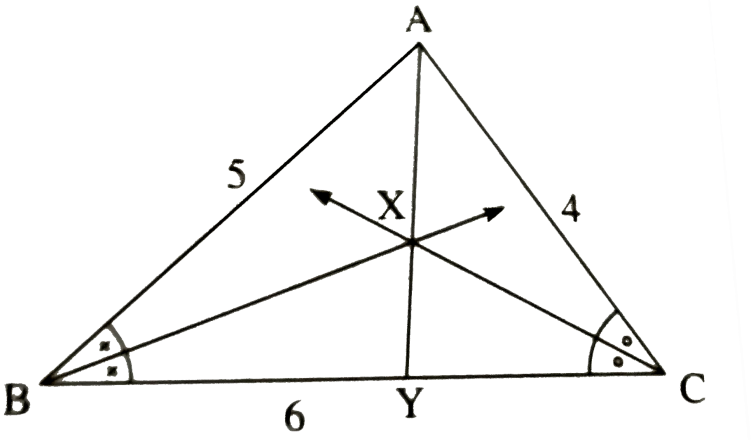
10. In the figure bisectors of $\angle B$ and $\angle C$ of ΔABC intersect each

other in point X. Line AX intersects side BC in pont Y. $AB = 5, AC = 4, BC = 6$ then find $\frac{AX}{XY}$



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11. Complete the following activity to find the value of determinant:

$$\begin{vmatrix} 3 & -2 \\ 4 & 4 \end{vmatrix} = 3 \times \square - \square \times 4 = \square + 8 = \square.$$

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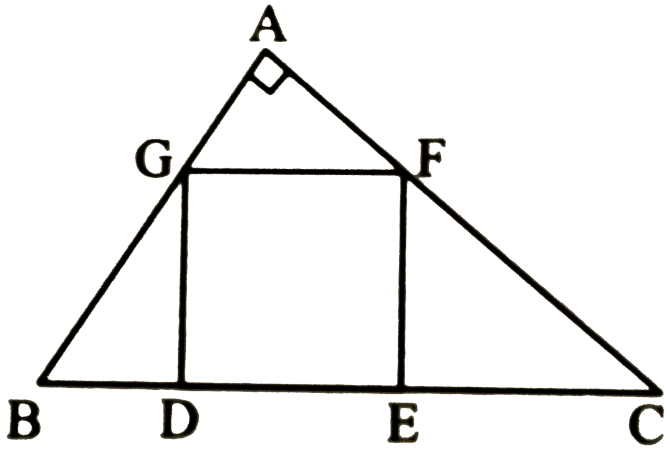
12. In the adjoining figure, the vertices of square DEFG are on the sides of ΔABC. If $\angle A = 90^\circ$, then prove that $DE^2 = BD \times EC$.



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