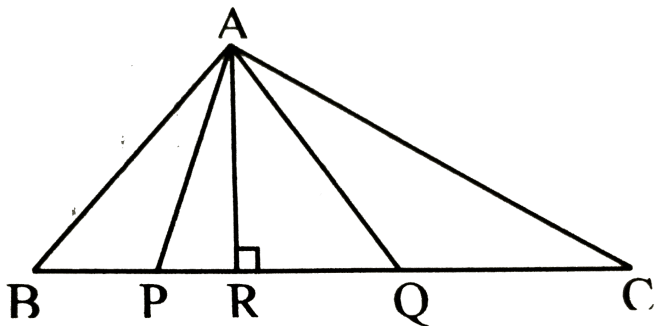# MATHS

BOOKS - TARGET PUBLICATION

SIMILARITY

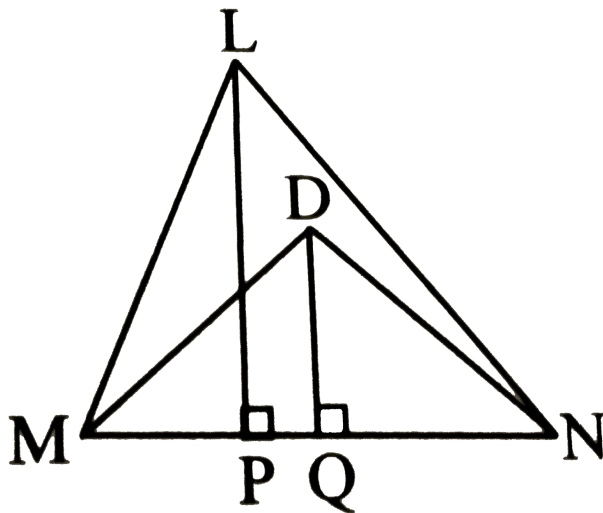## Fill In The Properly State The Reason

1. Find $\dfrac{A(\triangle ABC)}{A(\triangle APQ)}$.
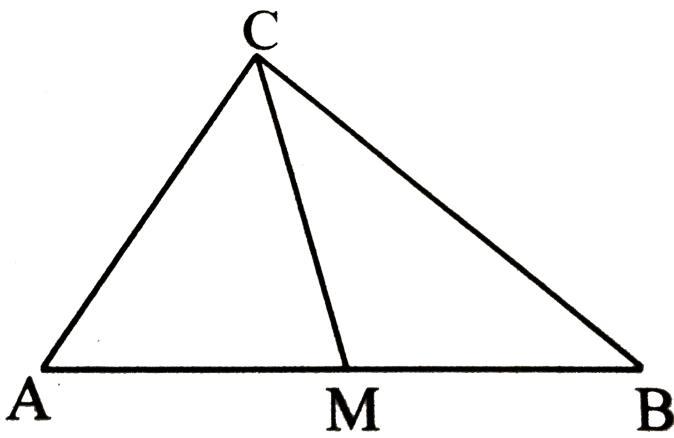
2. Find $\dfrac{A(\triangle LMN)}{A(\triangle DMN)}$

3. In the adjoining figure, M is the midpoint of seg AB and seg CM is a median of $\triangle ABC$. Find $\dfrac{A(\triangle AMC)}{A(\triangle BMC)}$.

Textual Activity

1. Draw a $\triangle ABC$.

1. Bisect $\angle B$ and name the point of intersection of AC and the angle bisecto as D.

2. Mesure the sides.

AB= ☐ cm , BC = ☐ cm,

AD = ☐ cm, DC = ☐ cm

3. Find rations $\dfrac{AB}{BC}$ and $\dfrac{AD}{DC}$.

4. You will find that both the rations are almost equal.

5. Bisect remaining angles of the triangle and find the

ration as

above. Verify that the ratios are equal.

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2. Draw three parallel lines.

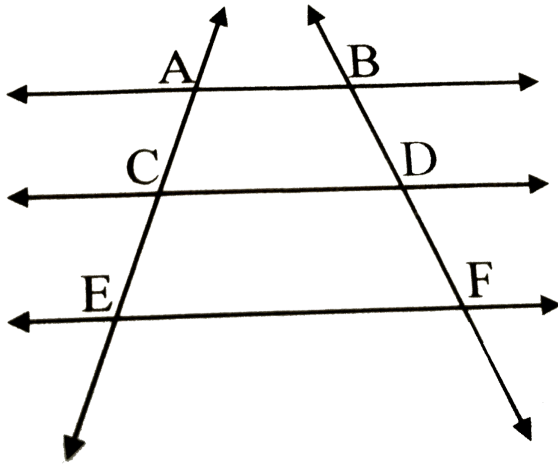i. Label them as l, m, n.

ii. Draw transversals t_1 and t_2.

iii. AB and BC are intercepts on transversal t_1.

iv. PQ and QR are intercepts on transversal t_2.

v. Find rations $\dfrac{AB}{BC}$ and $\dfrac{PQ}{QR}$. You will find that they are almost equal. Verify that they are equal.
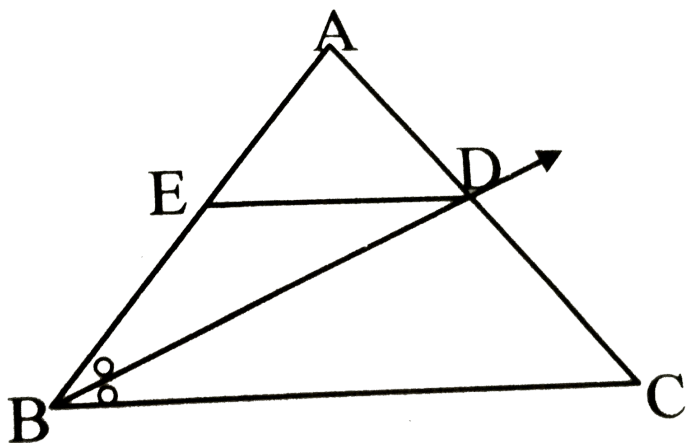
3. In the adjoining figure, $AB||CD||EF.$ If AC = 5.4, CE = 9, BD = 7.5, then find DF.

4. In $\triangle ABC$, ray BD bisects $\angle ABC$. $A - D - C$, $side\,DE\|side\,BC, A - E - B,$

then prove that $\dfrac{AB}{BC} = \dfrac{AE}{EB}$.
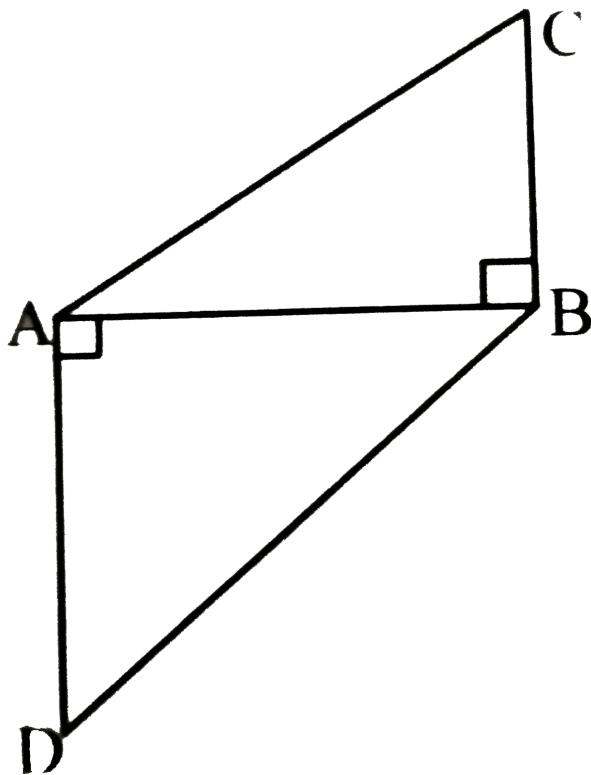
Practice Set 1 1

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.

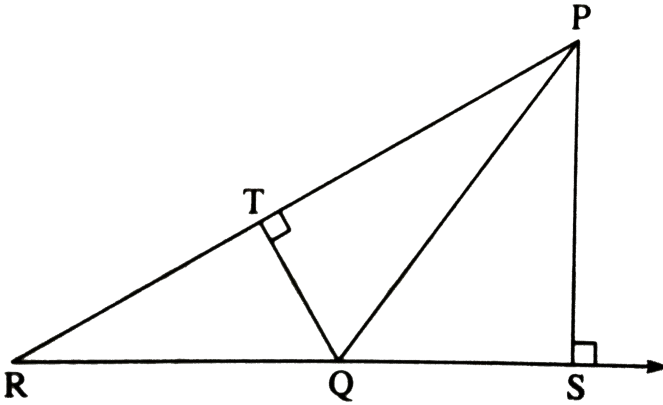**2.** In the adjoining figure, $BC \perp AB$, $AD \perp AB$, $BC = 4$,

$AD = 8,$ then find $\dfrac{A(\triangle ABC)}{A(\triangle ADB)}$..

3. In the following figure seg $PS \perp$ seg RQ, seg $QT \perp$ seg PR. If $RQ = 6$, $PS = 6$ and $PR = 12$, then find the QT.

4. In the adjoining figure, $AP \perp BC$, $AD||BC$, then find $A(\triangle ABC): A(\triangle BCD)$.
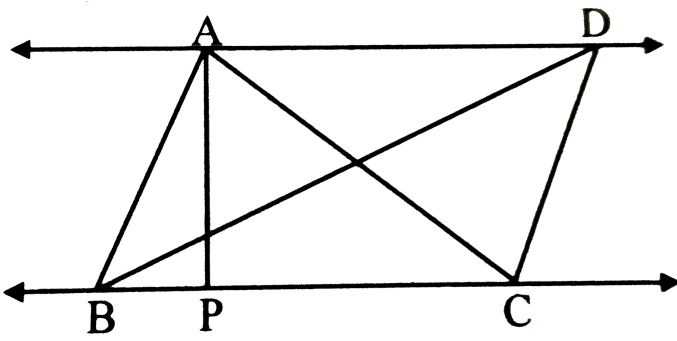
5. In the adjoining figure, $PQ \perp BC, AD \perp BC,$ then

find ratio

$$\frac{A(\triangle PQB)}{A(\triangle PBC)}.$$
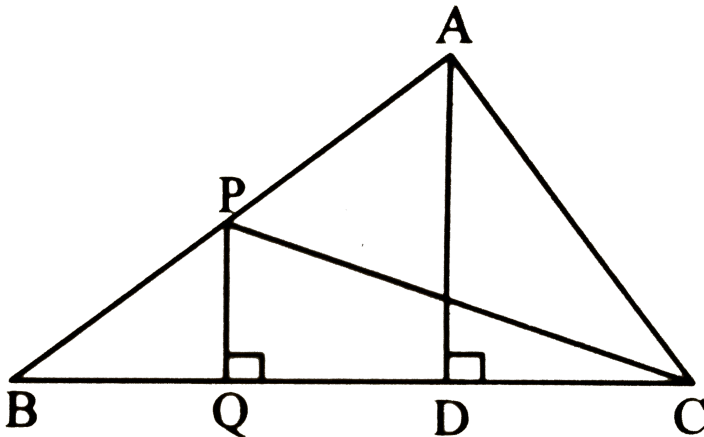
6. In the adjoining figure, $PQ \perp BC,\ AD \perp BC,$ then

find ratio

$$\frac{A(\triangle PBC)}{A(\triangle ABC)}.$$
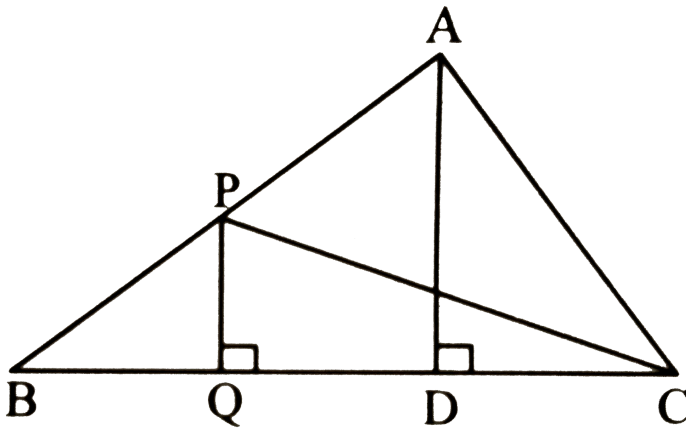
7. In the adjoining figure, $PQ \perp BC, AD \perp BC,$ then

find ratio
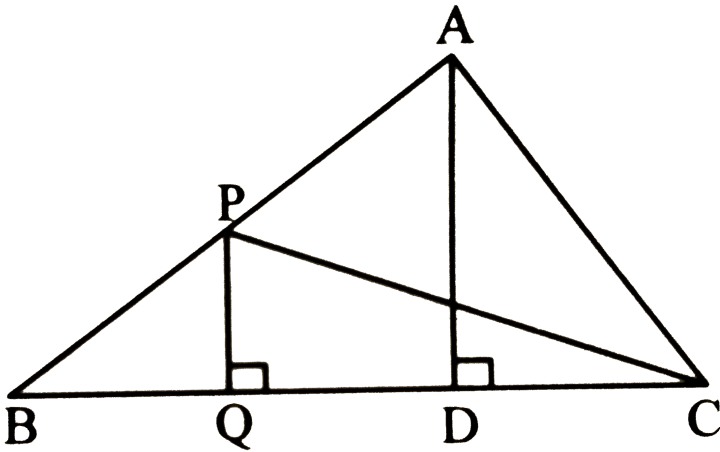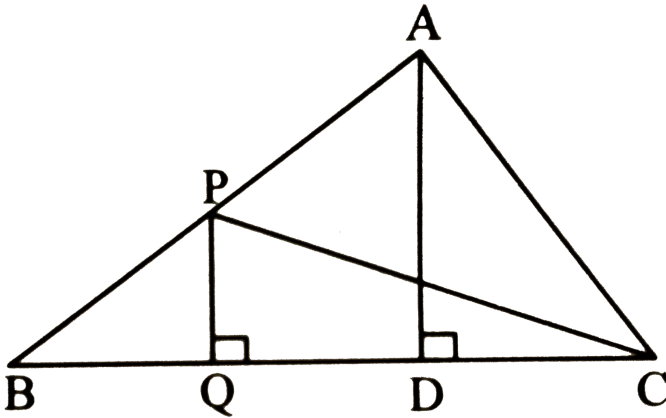
$\dfrac{A(\Delta ABC)}{A(\Delta ADC)}.$

8. In the adjoining figure, $PQ \perp BC, AD \perp BC,$ then

find ratio
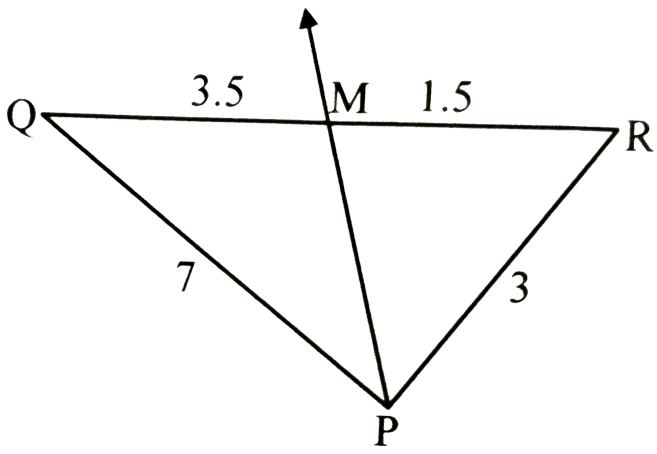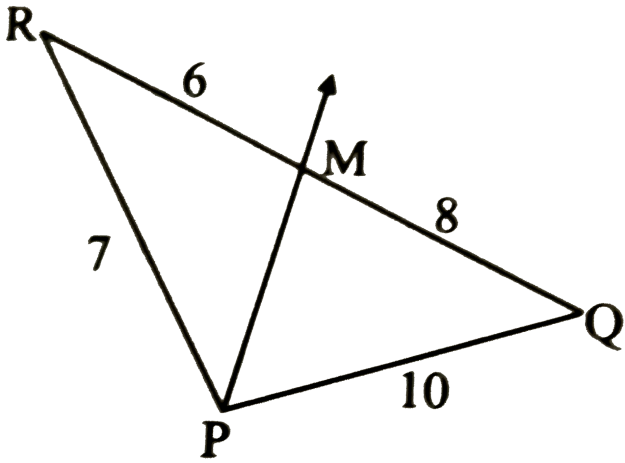
$$\frac{A(\triangle ADC)}{A(\triangle PQC)}$$

Practice Set 1 2

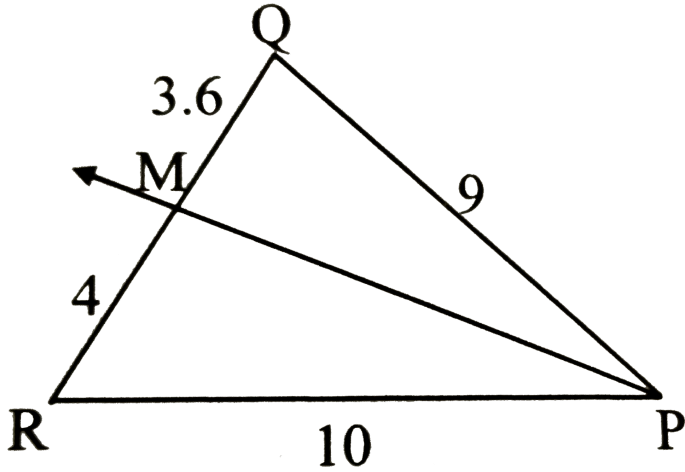**1.** Given below are some triangle and lengths of line segments. Identify in which figures, ray PM is the bisector of $\angle QPR$.

i.

ii.

iii.

2. In $\triangle PQR$, $PM = 15$, $PQ = 25$, $PR = 20$, $NR = 8$.

State whether line NM is parallel to side RQ or not.
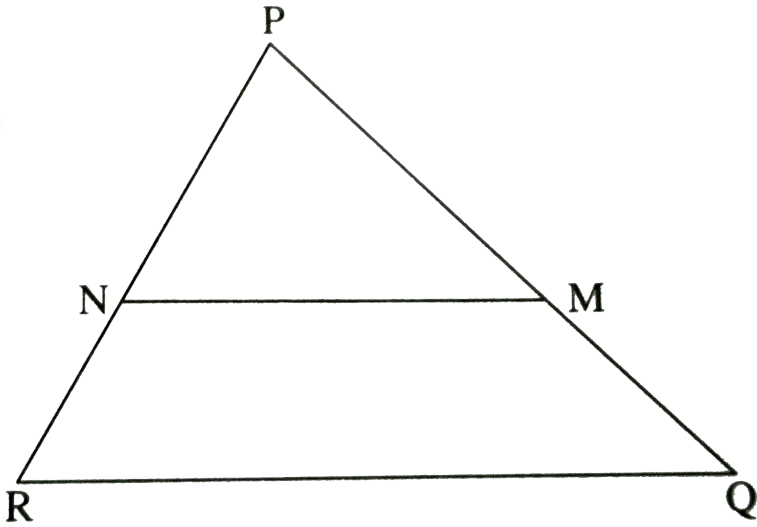
Given Reason.

3. In $\triangle MNP, NQ$ is a bisector of $\angle N$. If $MN = 5, PN = 7, MQ = 2.5,$ the find QP.
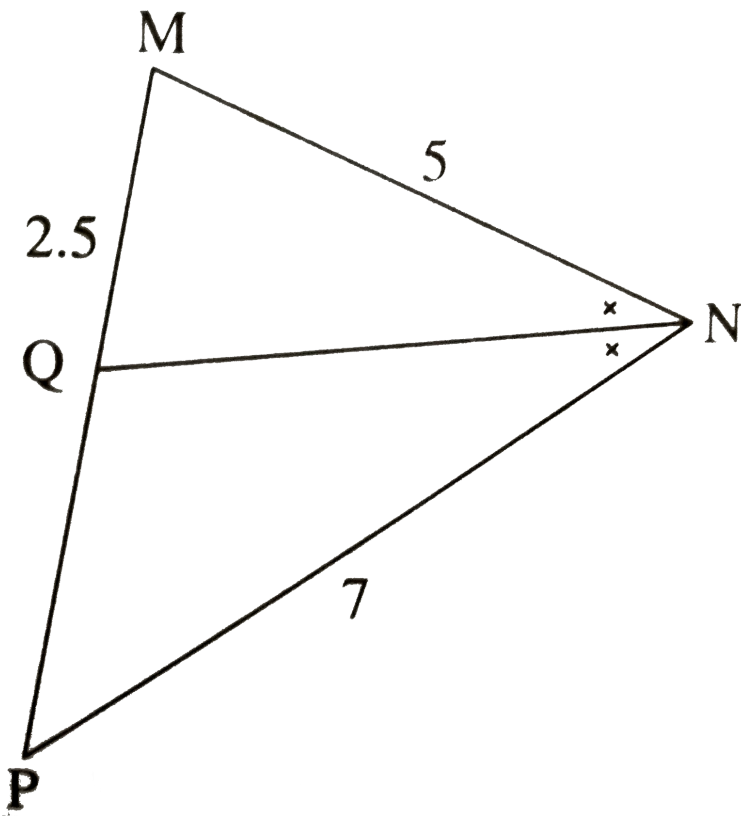
4. Measures of same angles in the figure are given. Prove that $\dfrac{AP}{PB} = \dfrac{AQ}{QC}$.
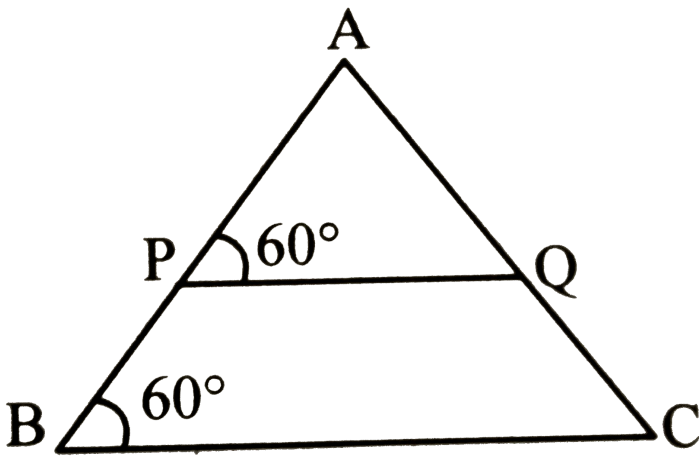
5. In trapezium ABCD side $AB \mid\mid$ side $PQ \mid\mid$ side DC,

$AP = 15, PD = 12, QC = 14$, find BQ.
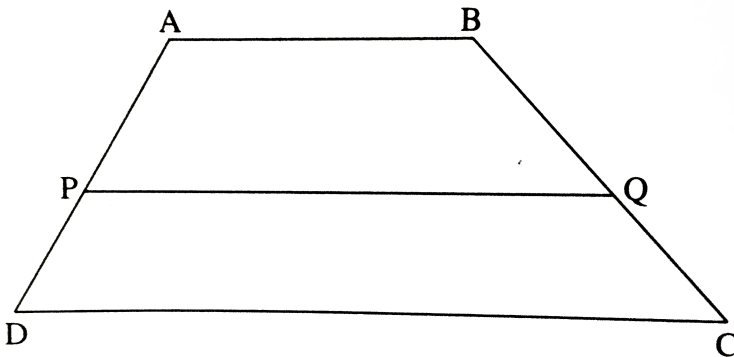
6. Find QP using given information in the figure.
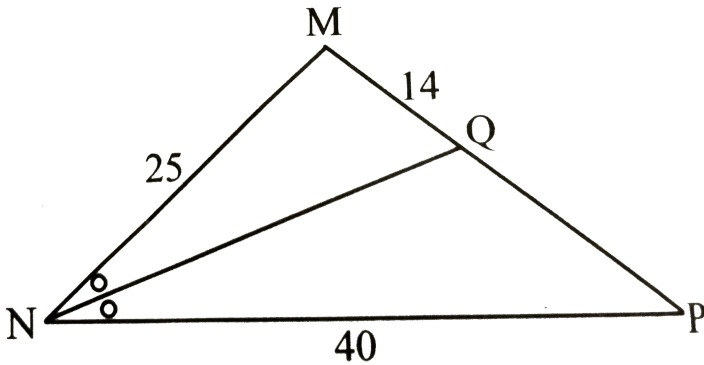
7. In the adjoining figure, if $AB||CD||FE,$ then find x and AE.
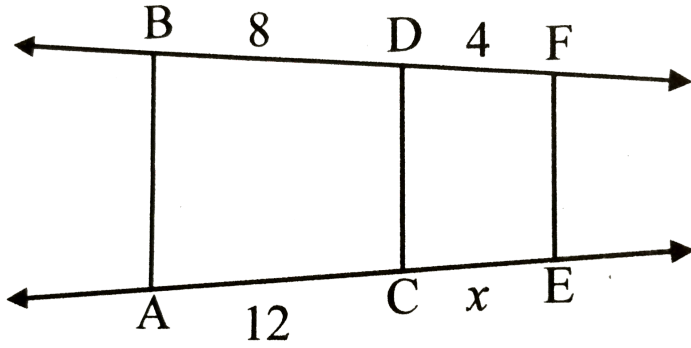
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8. In $\triangle LMN$, ray MT bisects $\angle LMN$. If $LM = 6, MN = 10.$

$TN = 8$ then find LT.
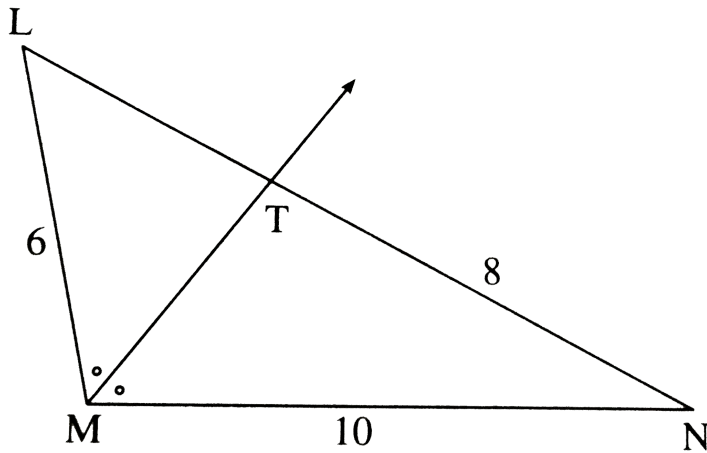
9. In $\triangle ABC$ Seg BD bisects $\angle ABC$. If

$AB = x$, $BC = x + 5$, $AD = x - 2$, $DC = x + 2$,

then find the value of x.
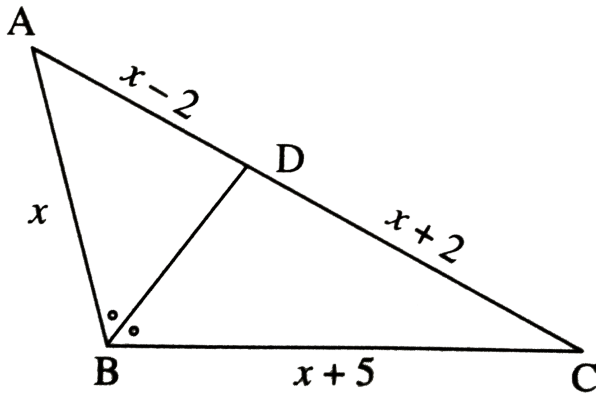
A

$x - 2$

D

x

$x + 2$

B

$x + 5$

C

10. In the figure X is any point in the interior of triangle.

Point X is joined

to vertices of triangle. Seg $PQ \parallel$ Seg DE, Seg $QR \parallel$

Seg EF.

Prove that Seg $PR \,||\,$ Seg DF.
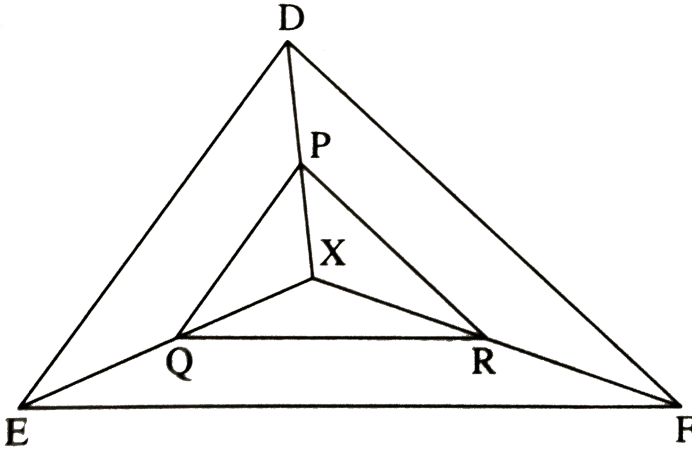
11. In $\triangle ABC$,ray BD bisects $\angle ABC$ and ray CE bisects $\angle ACB$.

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

1. In the adjoining figure, $\angle ABC = 75°$, $\angle EDC = 75°$.

State

which two triangle are similar and by which test? Also

write the similarity of these two triangles by a proper

one to one correspondence.
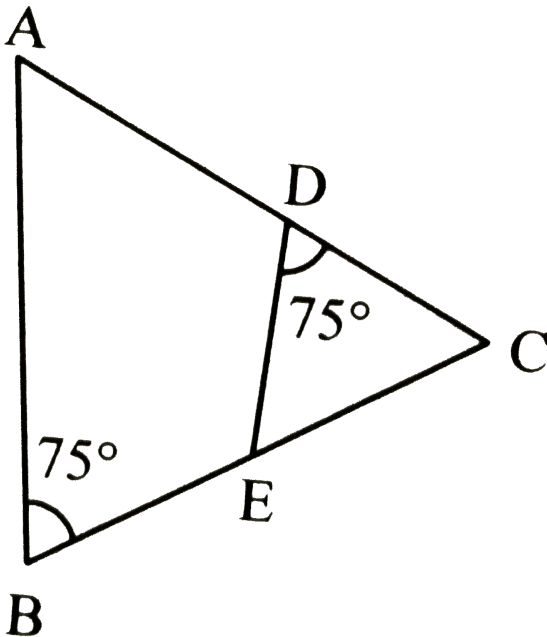
2. Are the triangle in the adjoining figure similar? If yes, by which test?
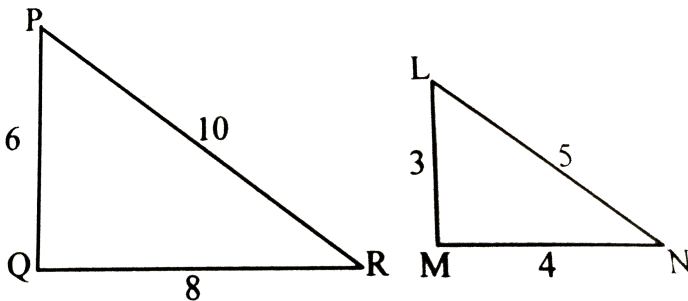
3. As shown in the figures, two poles of height 8m and 4m are perpendicular to the ground. If the length of shadow smaller pole due to sunlight is 6 m then long will be the shadow of

the bigger

pole of the same time?
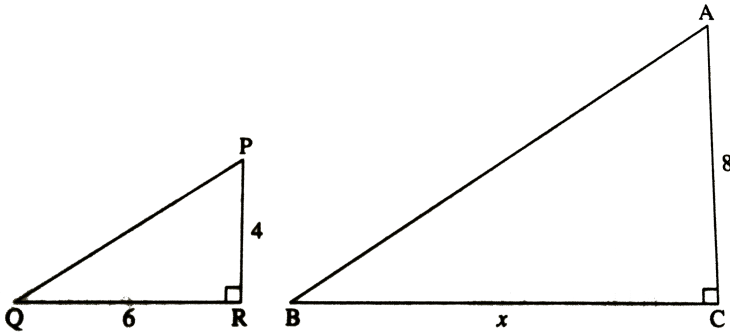
4.   In

$\triangle ABC, AP \perp BC, BQ \perp AC. B - P - C, A - Q - C,$

then prove that $\triangle CPA \sim \triangle CQB.$

If $AP = 7$, $BQ = 8$, $BC = 12$ then find AC.
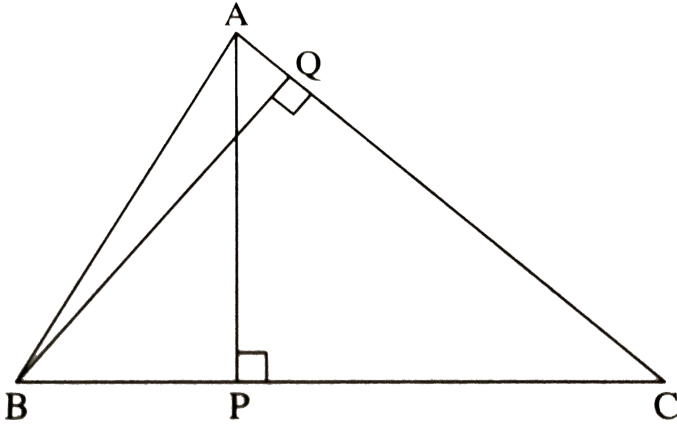
5. Given : In trapezium PQRS, side PQ||SR, AR = 5 AP, AS = 5 AQ, then prove that SR=5 PQ.
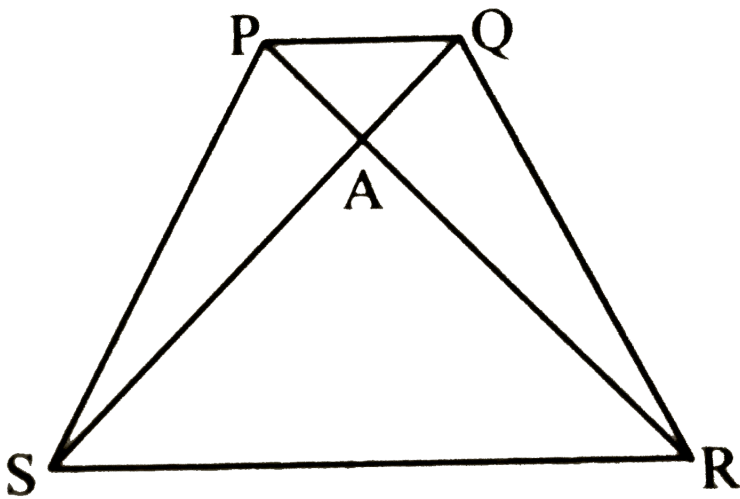
6. In trapezium ABCD side $AB \mid \mid$ side DC, diagonals AC

and BD

intersect In point O. If $AB = 20, DC = 6, OB = 15$

then find OD.
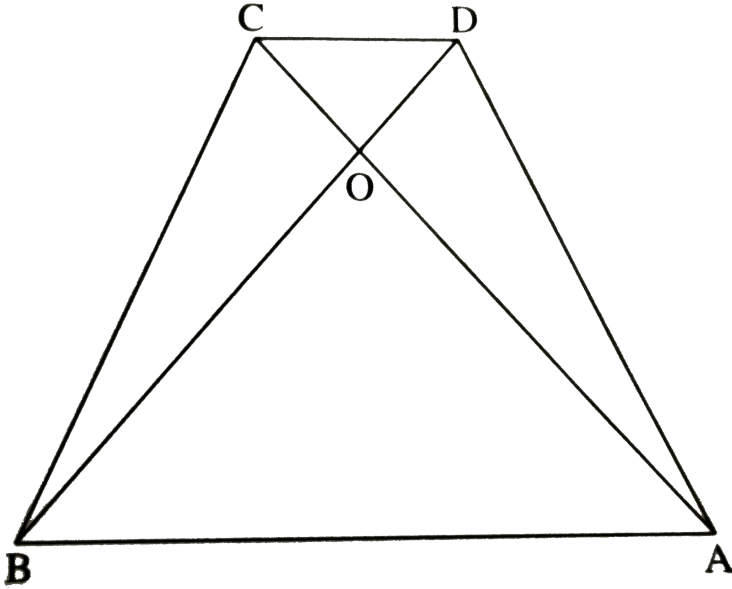
7. $\square ABCD$ is a parallelogram. Point E is on side BC.

Line DE intersects Ray AB in point T. Prove that

$DE \times BE = CE \times TE.$

8. In the figure, seg AC and seg BD intersect each other in point P

and $\dfrac{AP}{CP} = \dfrac{BP}{DP}$. Prove that $\triangle ABP \sim \triangle CDP$.

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

$$CA^2 = CB \times CD.$$
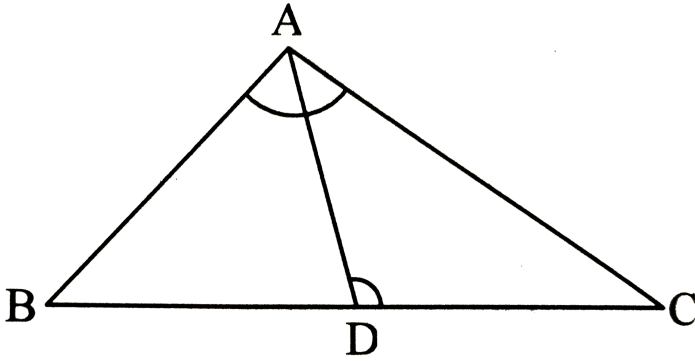
Practice Set 1 4

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

2. If

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

then

fill in the blanks:

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

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3. $\triangle LMN \sim \triangle PQR,$

$9 \times A(\triangle PQR) = 16 \times A(\triangle LMN).$ If $QR = 20,$ then

find $MN.$

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4. 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.

5. $\triangle ABC$ and $\triangle DEF$ are equilateral triangles. $A(\triangle ABC) : A(\triangle DEF) = 1:2$ and $AB = 4$, find DE.

6. In the adjoining figure, seg PQ||seg DE, $A(\Delta PQF) = 20$ sq. uints,

$PF = 2DP$, then find A $(\square DPQE)$
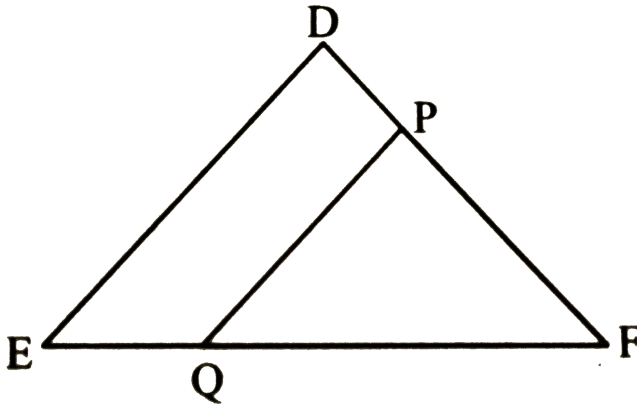
Problem Set 1

1. In $\triangle ABC$ and $\triangle PQR$, in a one to one correspondence.

$$\frac{AB}{QR} = \frac{BC}{PR} = \frac{CA}{PQ}, \text{then}$$
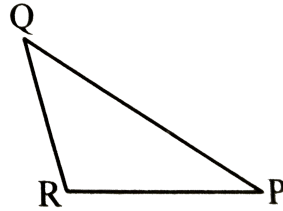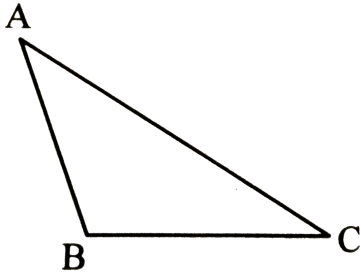
A. (a) $\Delta PQR \backsim \Delta ABC$

B. (b) $\Delta PQR \backsim \Delta CAB$

C. (c) $\Delta CBA \backsim \Delta PQR$

D. (d) $\Delta BCA \backsim \Delta PQR$

Answer: B

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2. If in $\triangle DEF$ and $\triangle PQR$, $\angle D \cong \angle Q$, $\angle R \cong \angle E$,

then which

of the following statements is false?
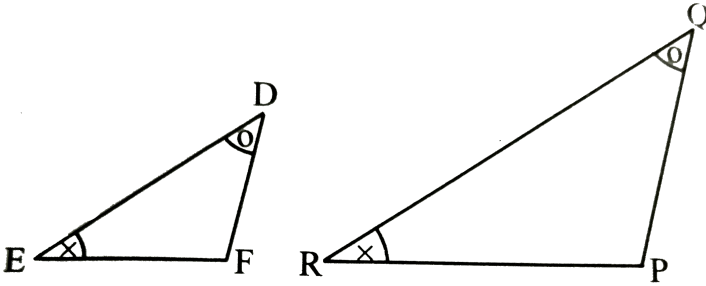
A. (a) $\dfrac{EF}{PR} = \dfrac{DF}{PQ}$

B. (b) $\dfrac{DE}{PQ} = \dfrac{EF}{RP}$

C. (c) $\dfrac{DE}{QR} = \dfrac{DF}{PQ}$

D. (d) $\dfrac{EF}{RP} = \dfrac{DE}{QR}$

Answer: B

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3. In $\triangle ABC$ and $\triangle DEF$, $\angle B = \angle E, \angle F = \angle C$ and

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

triangles is true?
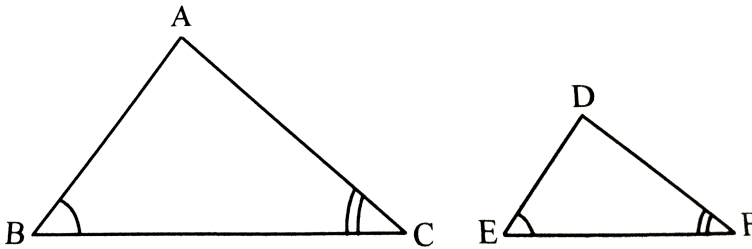
A. (a) The triangles are not congruent and not

similar.

B. (b) The triangles are similar but not congruent.

C. (c) The triangles are congruent and similar.

D. (d) None of the statements above is true.

Answer: B

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4. $\triangle ABC$ and $\triangle DEF$ are equilateral triangles,

$A(\triangle ABC):A(\triangle DEF)=1:2.$

If $AB=4$ then what is the length of DE?
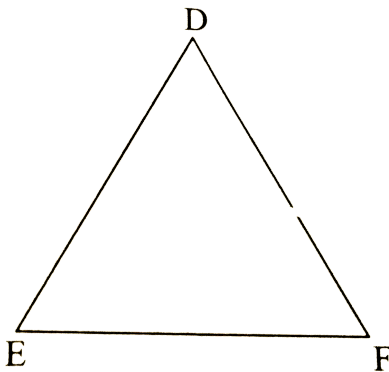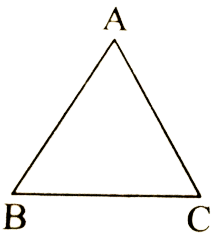
A. (a) $2\sqrt{2}$

B. (b) 4

C. (c) 8

D. (d) $4\sqrt{2}$

Answer: D

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5. In the adjoining figure, seg XY ||seg BC, then which of the following statements is true?
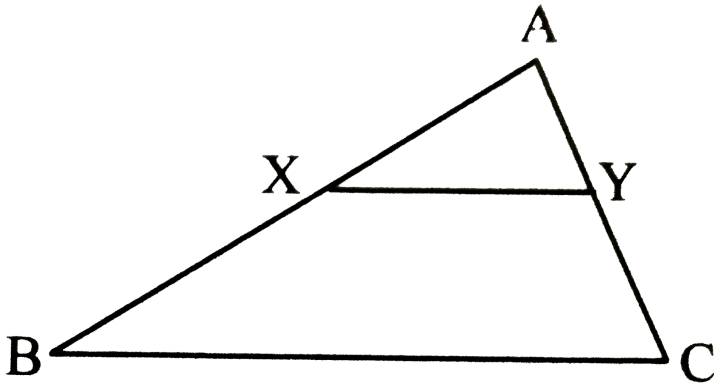
A. (a) $\dfrac{AB}{AC} = \dfrac{AX}{AY}$

B. (b) $\dfrac{AX}{XB} = \dfrac{AY}{AC}$

C. (c) $\dfrac{AX}{YC} = \dfrac{AY}{XB}$

D. (d) $\dfrac{AB}{YC} = \dfrac{AC}{XB}$

Answer: A

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6. In $\triangle ABC$, $B - D - C$ and $BD = 7, BC = 20$, then

find the ratio.

$$\frac{A(\triangle ABD)}{A(\triangle ADC)}$$
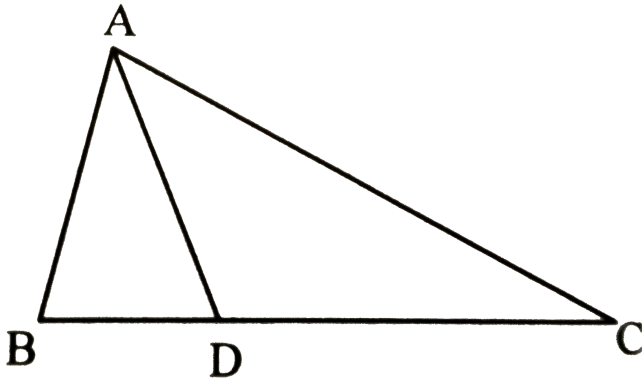
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7. In $\triangle ABC$, $B - D - C$ and $BD = 7, BC = 20$, then

find the ratio

$$\frac{A(\triangle ABD)}{A(\triangle ABC)}$$
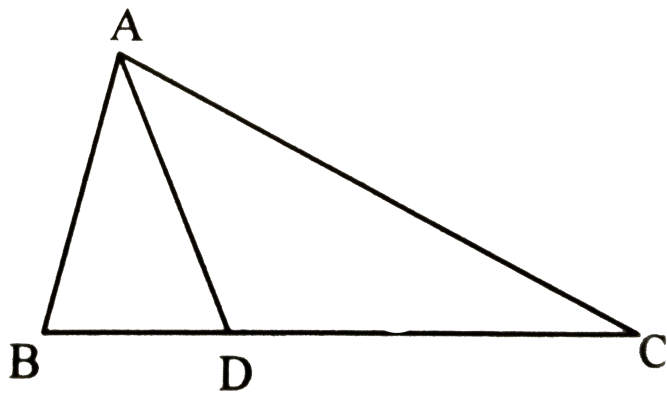
8. In $\triangle ABC$, $B - D - C$ and $BD = 7, BC = 20,$

then

find following rations.

$$\frac{A(\triangle ADC)}{A(\triangle ABC)}$$
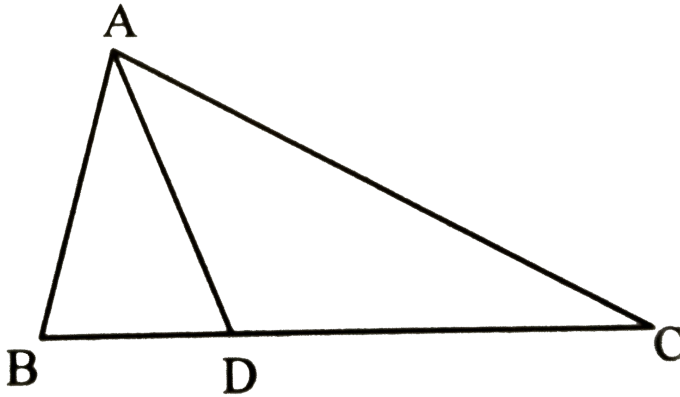
9. Ratio of areas of two triangles with equal height is 2:3. If base of smaller triangle is 6 cm then find the corresponding base of the bigger triangle.

10. In the adjoining figure,

$\angle ABC = \angle DCB = 90°$, $AB = 6$, $DC = 8$, then

$\dfrac{A(\triangle ABC)}{A(\triangle DCB)} = ?$
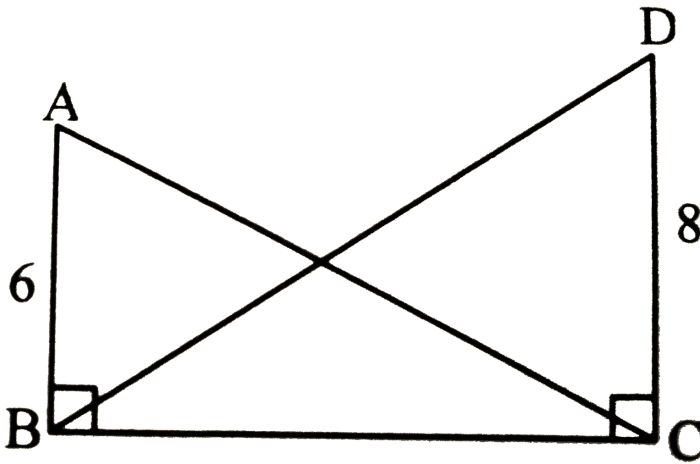
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11. In the adjoining figure, PM = 10 cm, $A(\triangle PQS) = 100sq.\ cm,$

$A(\triangle QRS) = 110sq.\ cm,$ then find NR.
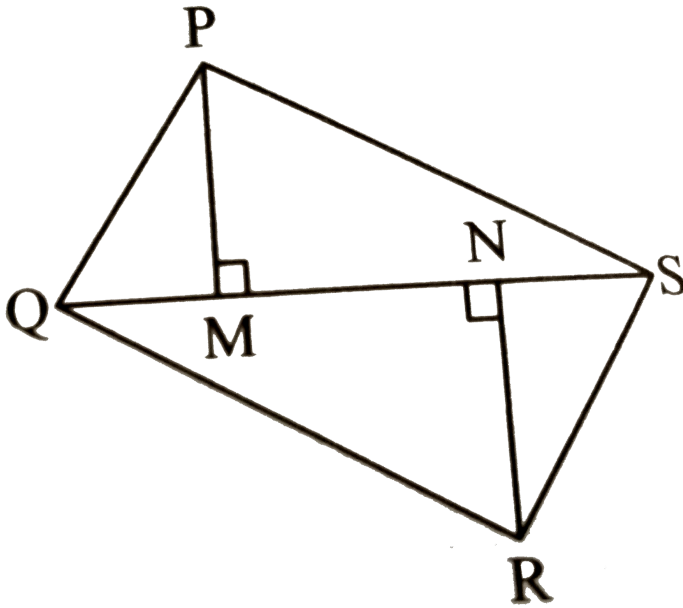
12. $\triangle MNT \sim \triangle QRS.$ Length of altitude drawn from point T is 5 and length of altitude drawn from point S is 9. Find the ratio

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

13. In the figure $A - D - C$ and $B - E - C$ seg $DE \, || \,$ side AB. If $AD = 5, DC = 3, BC = 6.4$ then find BE.
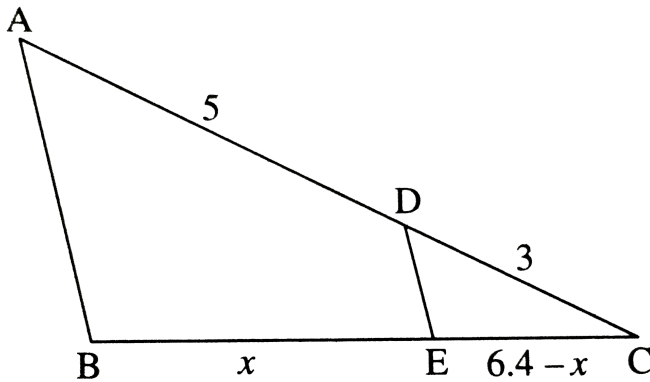
14. In the adjoining figure, seg PA , seg QB, seg RC and seg SD are perpendicular to line AD. AB = 60, BC = 70, CD = 80, PS = 280, then find PQ, QR and RS.
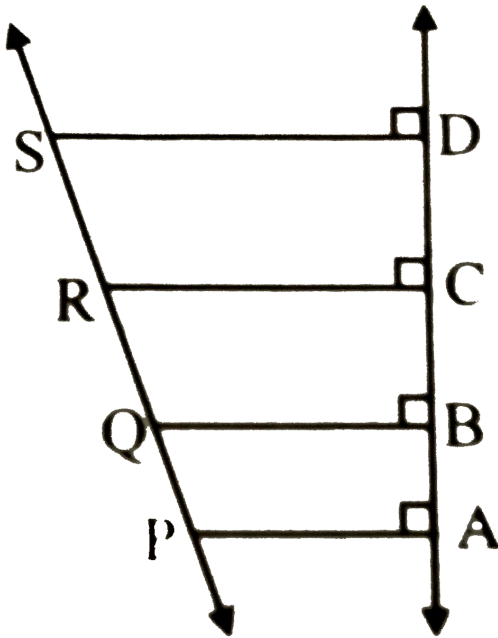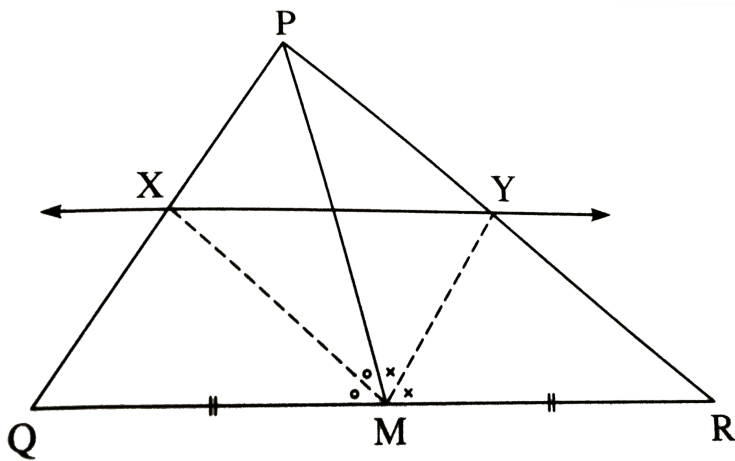
15.

In $\triangle PQR$ seg PM is a median. Angle bisectors of $\angle PMQ$ and $\angle PMR$ interesect $side PQ$ and $side PR$ in points X and Y respectively. Prove that $XY \mid \mid QR$.

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16. In the figure bisectors of $\angle B$ and $\angle C$ of $\triangle ABC$ intersect each

other in point X. Line AX intersects side BC in pont Y.

$AB = 5$, $AC = 4$, $BC = 6$ then find $\dfrac{AX}{XY}$
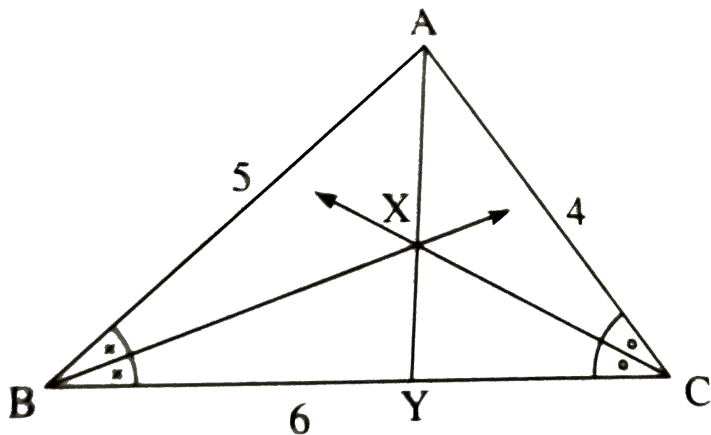
17. In $\square ABCD$, seg $AD \parallel$ seg BC. Diagonal AC and digonal BD intersect each other in point P. Then show

that $\dfrac{AP}{PD} = \dfrac{PC}{BP}$.
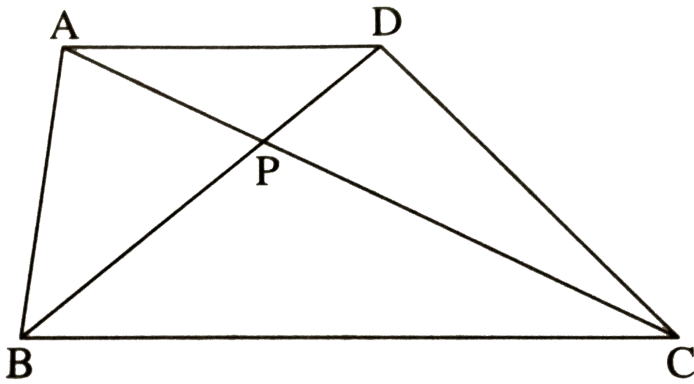
18. In the adoining figure, XY $\parallel$ seg AC. If 2 AX = 3 BX and XY = 9, find the value of AC.
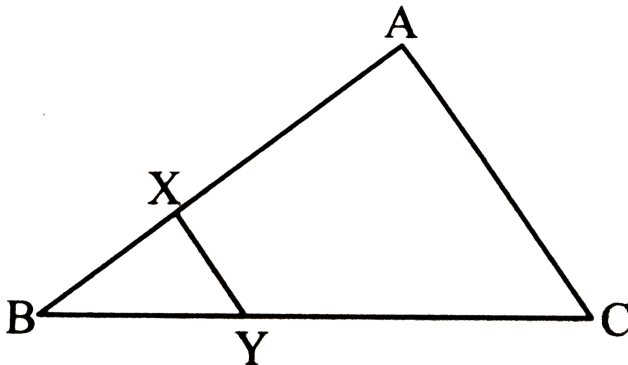
19. In the adjoining figure, the vertices of square DEFG are on the sides of $\triangle ABC$. If $\angle A = 90°$, then prove that $DE^2 = BD \times EC$.

Activites For Practice

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

2. In $\triangle ABC$,ray BD bisects $\angle ABC$ and ray CE bisects $\angle ACB.$

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

3. $\triangle\,ABC$ and $\triangle\,DEF$ are equilateral triangles. $A(\triangle\,ABC):A(\triangle\,DEF)=1:2$ and $AB=4$, find DE.

4. 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.

1. In the given figure, if AD = 5 cm and CE = 3 , then

$$\frac{A(\triangle ABD)}{A(\triangle BED)} = \text{---------.}$$
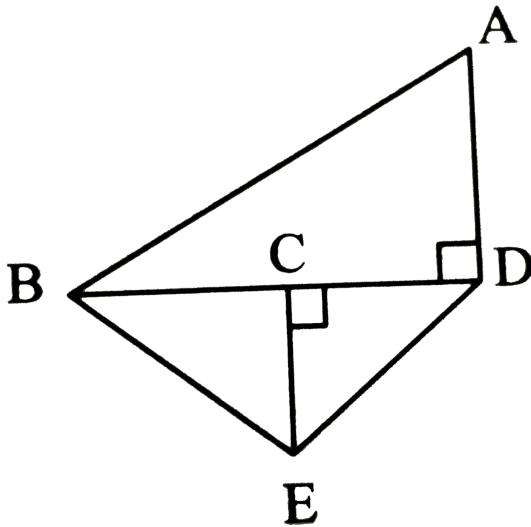
A. (a) $\dfrac{5}{3}$

B. (b) $\dfrac{25}{9}$

C. (c) $\dfrac{3}{5}$

D. (d) $\dfrac{5}{8}$

Answer: A

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2. In $\triangle PQR$, Q - A - R and QA = 6 cm, QR = 11 cm ,

then $\dfrac{A(\triangle PRA)}{A(\triangle PQA)} =$
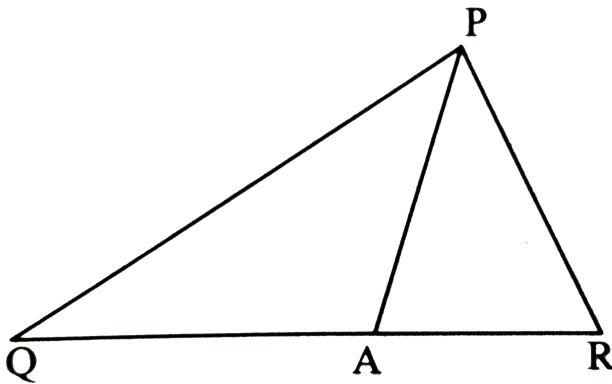
A. (a) $\dfrac{5}{6}$

B. (b) $\dfrac{6}{5}$

C. (c) $\dfrac{3}{5}$

D. (d) $\dfrac{5}{3}$

Answer: A

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3. For the figure given below, if line l || line m,

then $\dfrac{A(\triangle PQS)}{A(\triangle TRS)} =$ _____.
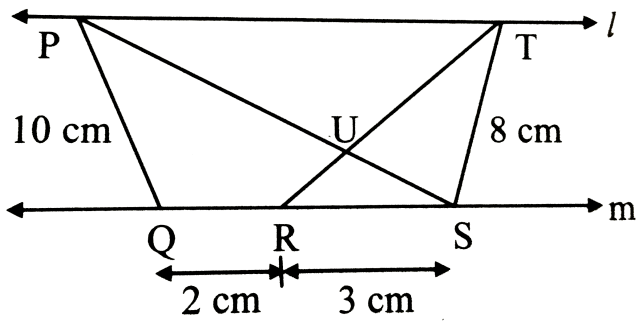
A. (a) $\dfrac{2}{3}$

B. (b) $\dfrac{5}{3}$

C. (c) $\dfrac{5}{2}$

D. (d) $\dfrac{25}{12}$

Answer: B

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4. In the figure, RP : PK = 11 : 8, then $\dfrac{A(\triangle TRP)}{A(\triangle TPK)} =$
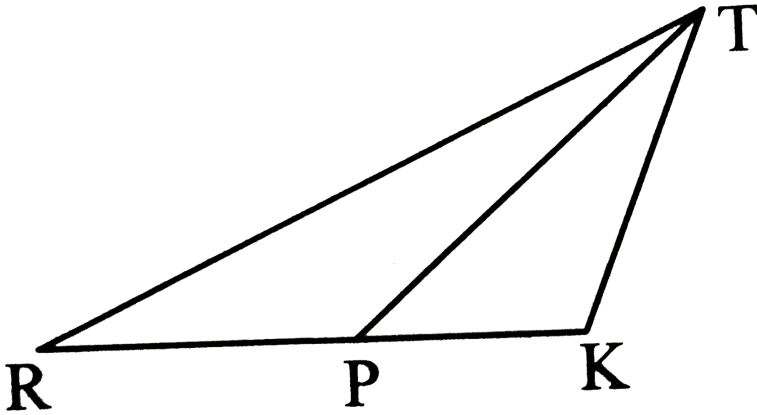
A. (a) $11:8$

B. (b) $8:11$

C. (c) $7:11$

D. (d) $11:19$

Answer: A

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5. Ratio of areas of two triangles with equal bases is 3 :

4. If height of

the bigger triangle is 20 cm, then the corresponding

height of the smaller triangle is

A. (a) $4cm$

B. (b) $9cm$

C. (c) $12cm$

D. (d) $15cm$

Answer: D

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6. If $A(\triangle ABC) = A(\triangle LMN)$, then MN =
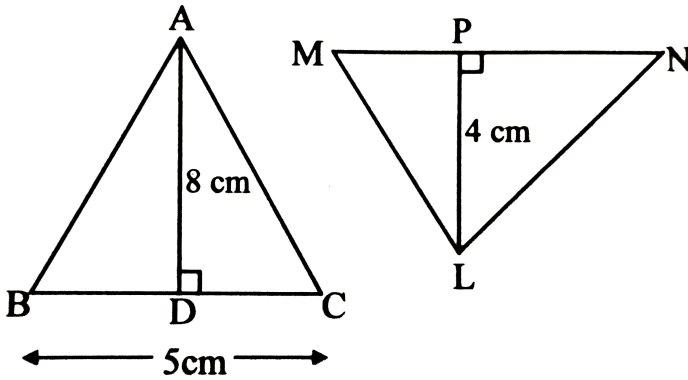
A. (a) $40cm$

B. (b) $10cm$

C. (c) $4cm$

D. (d) $20cm$

Answer: B

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7. In the given figure, if DE $\parallel$ AC , then AB =
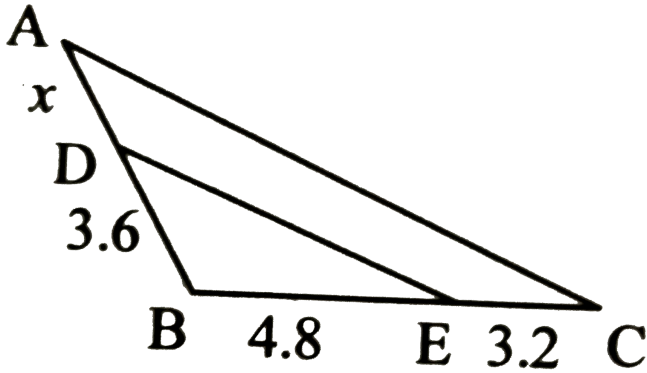
A. (a) 2.4 units

B. (b) 5.4 units

C. (c) 6 units

D. (d) 9 units

Answer: C

8. X and Y are points on sides AB and AC respectively of $\triangle ABC$. For which of the following cases will XY be parallel to BC?

A. (a) AX = 1.3 cm, XB = 3.9 cm,

   AY = 2.8 cm, YC = 5.6 cm,

B. (b) AX = 1.3 cm, XB = 3.9 cm,

   AY = 2.8 cm, YC = 8.4 cm

C. (c) AX = 1.3 cm, XB = 2.6 cm,

   AY = 2.8 cm, YC = 8.4 cm

D. (d) AX = 1.3 cm, XB = 2.6 cm,

AY = 2.8 cm, YC = 11.2 cm

Answer: B

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9. In the given figure, DE || BC. If AB = 12 cm and AD =

3cm,

then AE : EC =
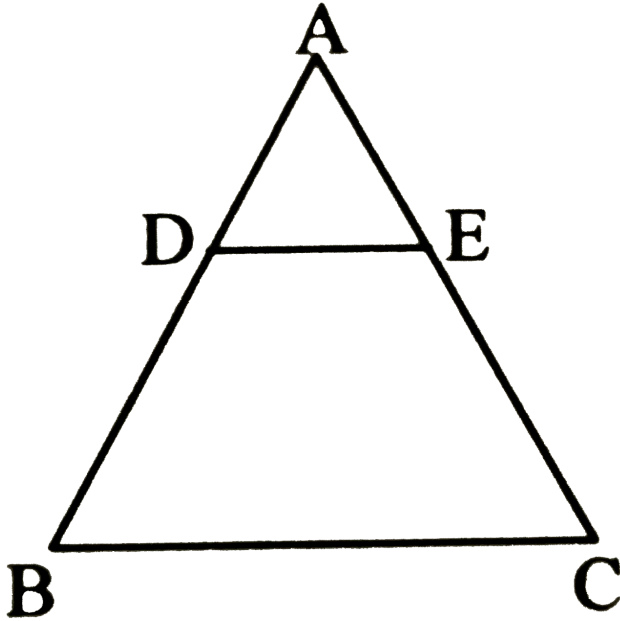
A. (a) $1:2$

B. (b) $1:3$

C. (c) $1:4$

D. (d) $4:1$

Answer: B

10. In $\triangle PQR$, if ST $||$ QR, then what is the value of x?
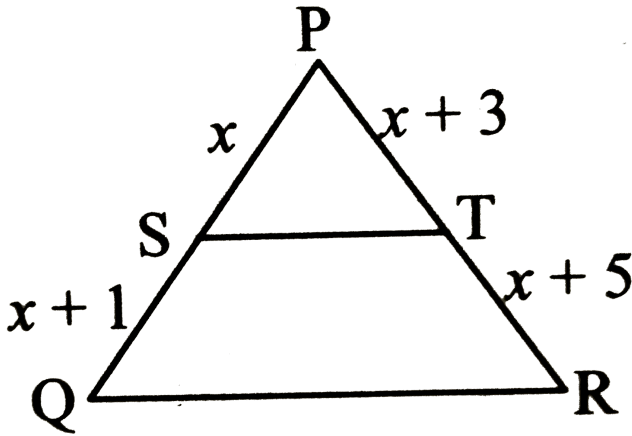
A. (a) 1

B. (b) 2

C. (c) 3

D. (d) 4

Answer: C

11. Ray BD is the angle bisector of $\angle ABC$. The perimeter of $\triangle ABC$ is
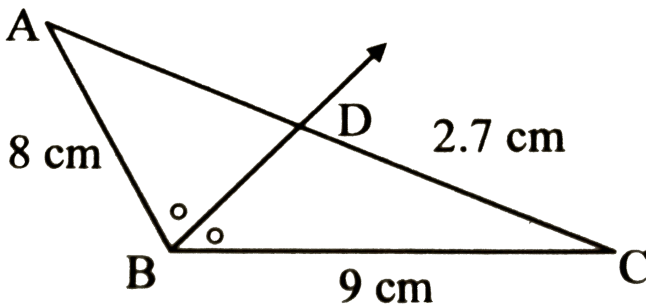
A. (a) 2.4 cm

B. (b) 3.1 cm

C. (c) 22.1 cm

D. (d) 22.8 cm

Answer: C

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12. $\square\,PQRS$ is a trapezium, and AB $||$ PS $||$ QR. If PA = 3 cm,

AQ = 1.4 cm, BR = 2.1 cm, then SB =
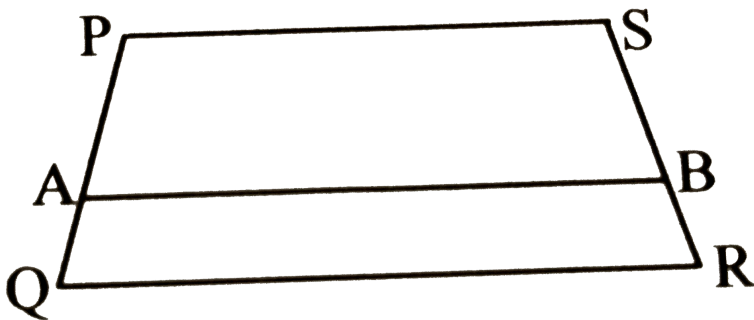
A. (a) 2 cm

B. (b) 2.5 cm

C. (c) 4 cm

D. (d) 4.5 cm

Answer: D

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13. In $\triangle ABC$ and $\triangle XYZ$, $\dfrac{AB}{YZ} = \dfrac{BC}{ZX} = \dfrac{AC}{XY}$, then by which correspondence are $\triangle ABC$ and $\triangle XYZ$ similar?

A. (a) ABC $\leftrightarrow$ XYZ

B. (b) ABC $\leftrightarrow$ YXZ

C. (c) ABC ↔ YZX

D. (d) BAC ↔ YZX

Answer: C

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14. If in ΔPQR and ΔXYZ, $\dfrac{PQ}{XY} = \dfrac{QR}{XZ}$ then the triangles will be similar, when

A. (a) $\angle P \cong \angle X$

B. (b) $\angle R \cong \angle Y$

C. (c) $\angle Q \cong \angle Y$

D. (d) $\angle Q \cong \angle X$

Answer: D

15. If $\triangle PQR \sim \triangle DEF$, $\angle P = 65°$ and $\angle F = 32°$, then $\angle Q$ is

A. (a) $32°$

B. (b) $65°$

C. (c) $83°$

D. (d) $97°$

Answer: C

16. In the given figure, if seg PQ|| seg BC such that $\dfrac{AP}{AB} = \dfrac{2}{5}$, then $\dfrac{PQ}{BC}$ is equal to
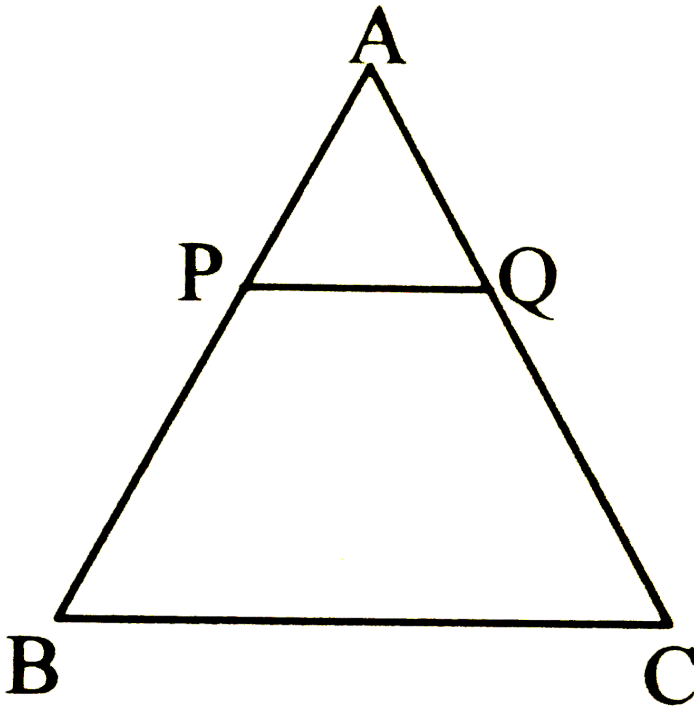
A. (a) $\dfrac{2}{3}$

B. (b) $\dfrac{2}{5}$

C. (c) $\dfrac{3}{2}$

D. (d) $\dfrac{5}{2}$

Answer: B

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17. In the figure, if $\triangle XYZ$ is right angled at Y and UV $\perp$ XZ, XZ = 13 cm , then the lengths of XV and UV

respectively are.
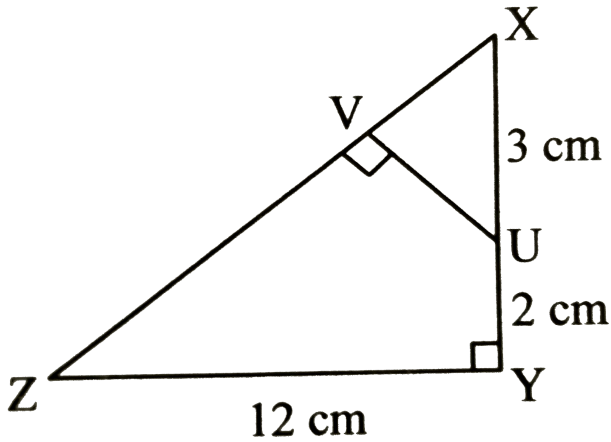
A. (a) 15cm, 36cm

B. (b) 36cm, 15cm

C. (c) $\dfrac{15}{13} cm, \dfrac{36}{13} cm$

D. (d) $\dfrac{36}{13} cm, \dfrac{15}{13} cm$

Answer: C

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18. A vertical pole of a length 6 m casts a shadow of 4 m long on the ground. At the same time a tower casts a shadow 28m long. Find the height of the tower.

A. 14 m

B. 28 m

C. 35 m

D. 42 m

Answer: D

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19. In the figure, $\triangle ABC \sim \triangle BPQ$. If $AB = BC$ and P is the midpoint

of seg BC, then $A(\triangle ABC) : A(\triangle BPQ) =$
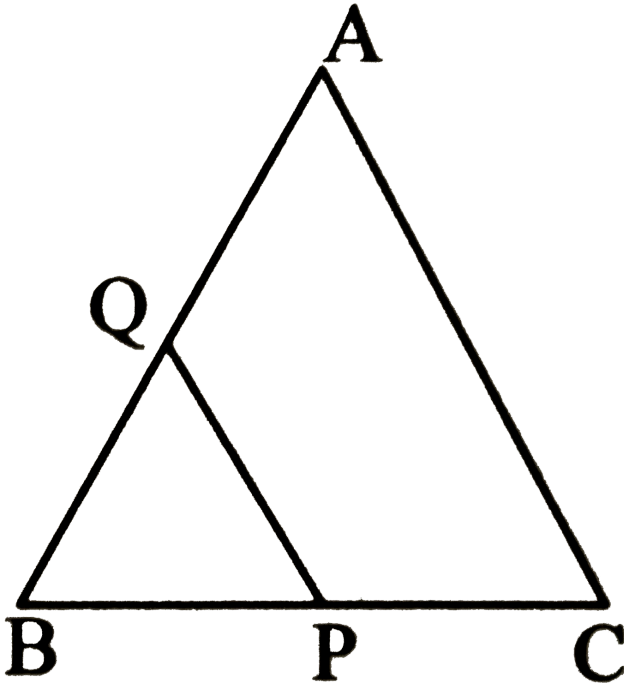
A. (a) $1:2$

B. (b) $2:1$

C. (c) $1:4$

D. (d) $4:1$

Answer: D

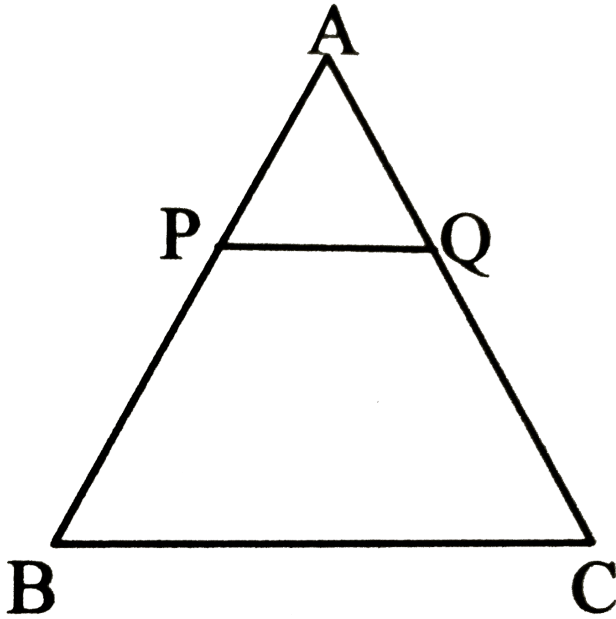▶ **Watch Video Solution**

20. In the figure, $\triangle ABC \sim \triangle APQ$. If AB 12 cm, and AQ $= \dfrac{1}{4}$ AC,

then the length of AP is

A. (a) 2 cm

B. (b) 3 cm

C. (c) 4 cm

D. (d) 6 cm

Answer: B

21. $\Delta PQR \sim \Delta XYZ.$ PQ : XY = 7 : 3, then $A(\Delta PQR) : A(\Delta XYZ) =$

    A. (a) $7:3$

    B. (b) $3:7$

    C. (c) $49:9$

    D. (d) $9:49$

Answer: C

22. If $\triangle ABC \sim \triangle PQR$ with $\dfrac{BC}{QR} = \dfrac{1}{3}$, then $\dfrac{ar(\triangle PRQ)}{ar(\triangle BCA)}$ is equal to

A. (a) 9

B. (b) 3

C. (c) $\dfrac{1}{3}$

D. (d) $\dfrac{1}{9}$

Answer: A

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23. $\triangle ABC \sim \triangle DEF$. If BC = 5 cm,EF = 7.5 cm and $A(\triangle DEF) = 45cm^2$, then $A(\triangle ABC)$ =

A. (a) $10cm^2$

B. (b) $20cm^2$

C. (c) $30cm^2$

D. (d) $40cm^2$

Answer: B

24. If the ratio of corresponding sides of similar

triangles is 3 : 4 ,

then the ratio of their areas is

A. (a) $3:4$

B. (b) $4:9$

C. (c) $9:16$

D. (d) $16:9$

Answer: C

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25. The areas of two similar triangles are $32cm^2$ and $50cm^2$.

The ratio of their corresponding sides is

A. (a) $3:7$

B. (b) $4:5$

C. (c) $5:4$

D. (d) $16:25$

Answer: B

26. $\triangle PQR \sim \triangle UTS$. If $A(\triangle PQR):A(\triangle UTS)$ = 16 : 9, and

TS = 1.8 cm, then QR =

A. (a) 1.35 cm

B. (b) 2.4 cm

C. (c) 3.2 cm

D. (d) 1.1 cm

Answer: B

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27. $\Delta DEF \sim \Delta MNK$. If $DE = 2, MN = 5,$ then find the value of $\dfrac{A(\Delta DEF)}{A(\Delta MNK)}$

A. (a) $\dfrac{2}{5}$

B. (b) $\dfrac{5}{2}$

C. (c) $\dfrac{4}{25}$

D. (d) $\dfrac{25}{4}$

Answer: C

28.   If $\Delta ABC \sim \Delta DEF$ such   that

$A(\Delta ABC) = 4A(\Delta DEF)$ and

AC = 6 cm, then DF =

   A. (a) 2 cm

   B. (b) 3 cm

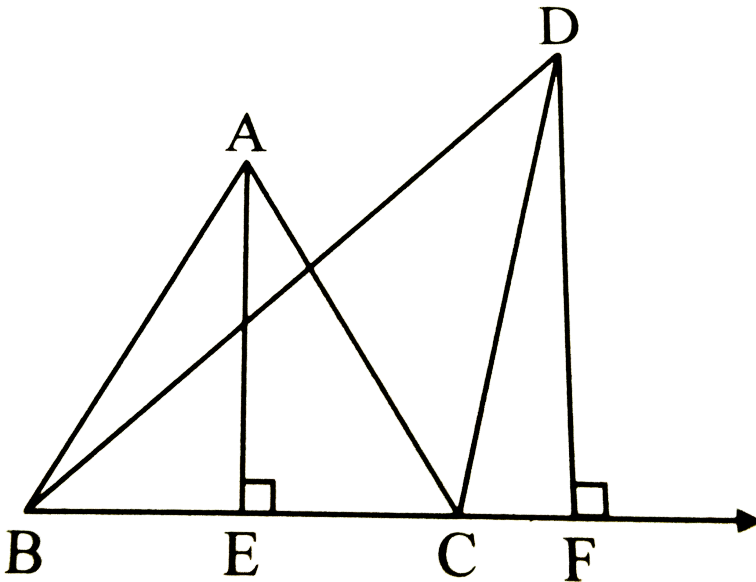   C. (c) 6 cm

   D. (d) 9 cm

Answer: B

1. In given figure, seg AE $\perp$ seg BC, seg DF $\perp$ line BC, AE = 4, DF = 6, then find $\dfrac{A(\triangle ABC)}{A(\triangle DBC)}$.

2. In the given figure, seg BE $\perp$ seg AB and seg BA $\perp$ seg AD.

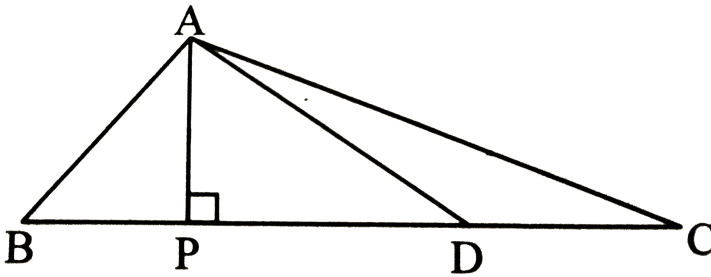If BE = 6 and AD = 9, then find $\dfrac{A(\triangle ABE)}{A(\triangle BAD)}$.
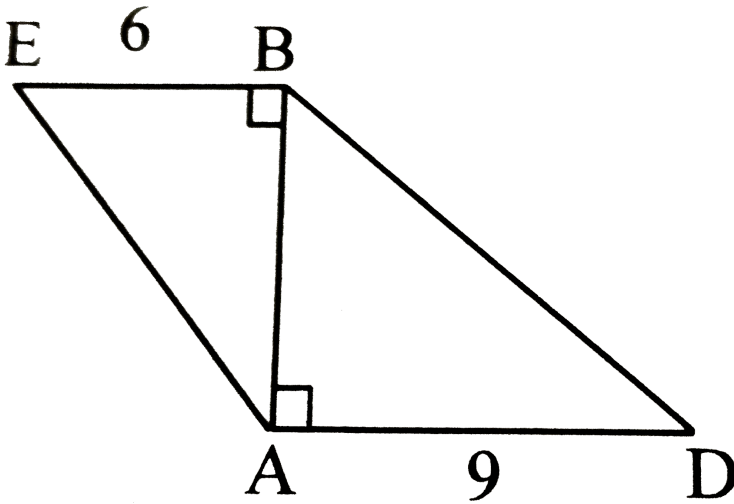
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3. In $\triangle ABC$, point D is on side BC such that DC = 6, BC = 15. find

(i) $A(\triangle ABD) : A(\triangle ABC)$ and
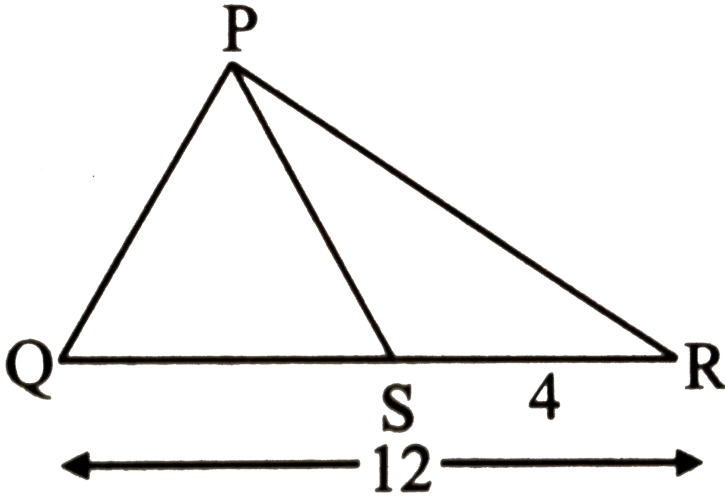
(ii) $A(\triangle ABD) : A(\triangle ADC)$.

4. In the given figure,QR = 12 and SR = 4.

Find the values of

(i) $\dfrac{A(\triangle PSR)}{A(\triangle PQR)}$

(ii) $\dfrac{A(\triangle PQS)}{A(\triangle PQR)}$
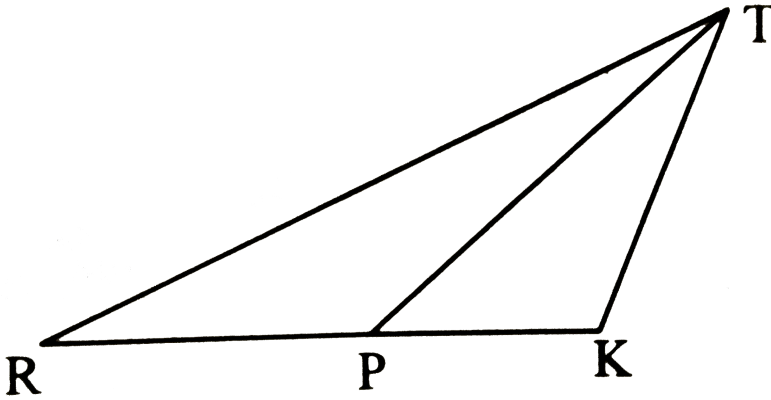
(iii) $\dfrac{A(\triangle PQS)}{A(\triangle PSR)}$

5. In the given figure, if RP : PK = 3: 2, then find the following ratios.

(i) $A(\triangle TRP) : A(\triangle TPK)$

(ii) $A(\triangle TRK) : A(\triangle TPK)$

(iii) $A(\triangle TRP) : A(\triangle TRK)$

6. In the given figure, in $\triangle ABC$, point D is on side AC. If

AC = 16,

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

i. $\dfrac{A(\triangle ABD)}{A(\triangle ABC)}$

ii. $\dfrac{A(\triangle BDC)}{A(\triangle ABC)}$

iii. $\dfrac{A(\triangle ABD)}{A(\triangle BDC)}$
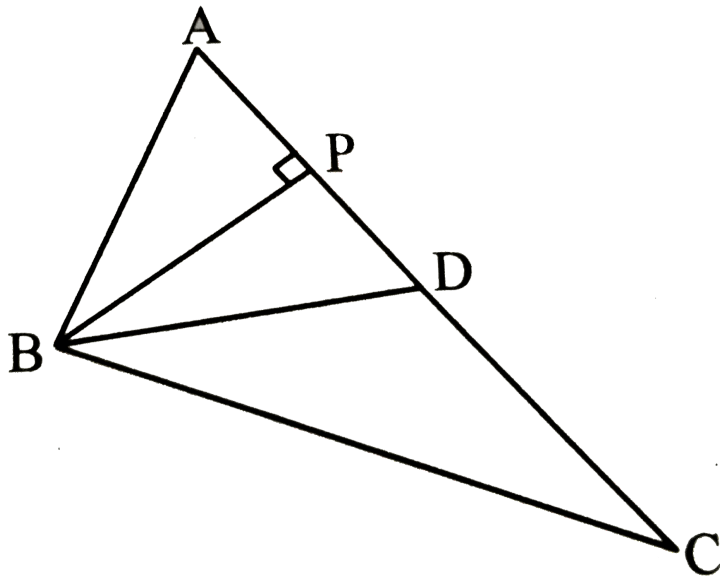
7. In the given figure, seg AE $\perp$ seg BC and seg DF $\perp$ seg BC. Find

i. $\dfrac{A(\triangle ABC)}{A(\triangle DBC)}$

ii. $\dfrac{A(\triangle DBF)}{A(\triangle DFC)}$
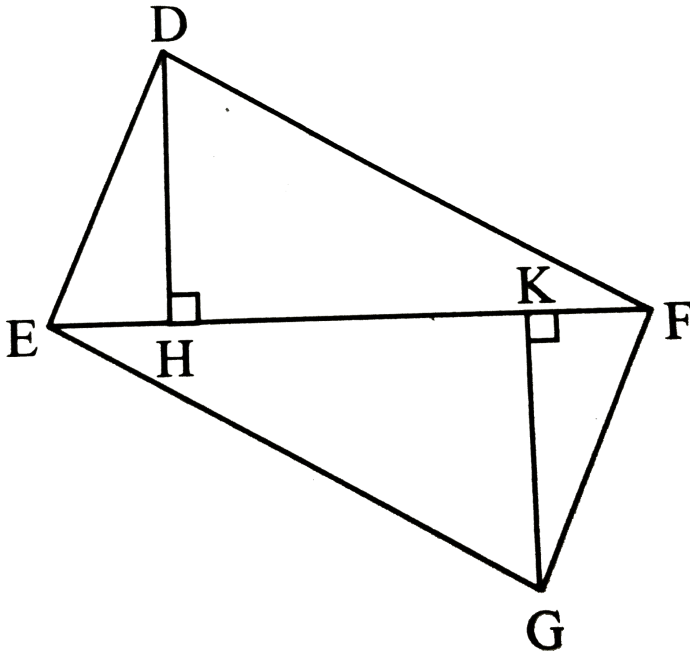
iii. $\dfrac{A(\triangle AEC)}{A(\triangle DBF)}$
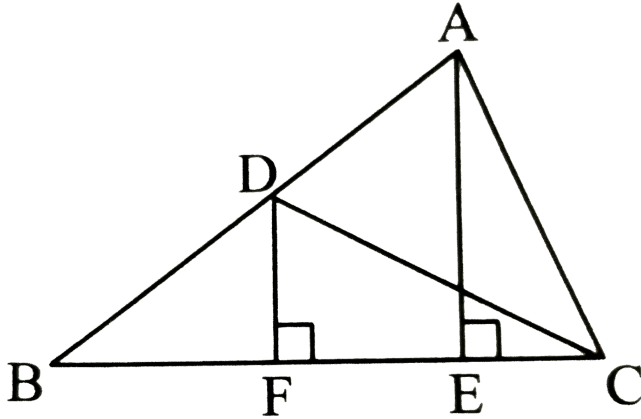
8. In the following figure, seg DH ⊥ seg EF and seg GK

⊥ EF. If DH = 6 cm, GK = 10 cm and $A(\triangle DEF) = 150cm^2$

, then find:

(i) EF

(ii) A($\triangle GEF$)
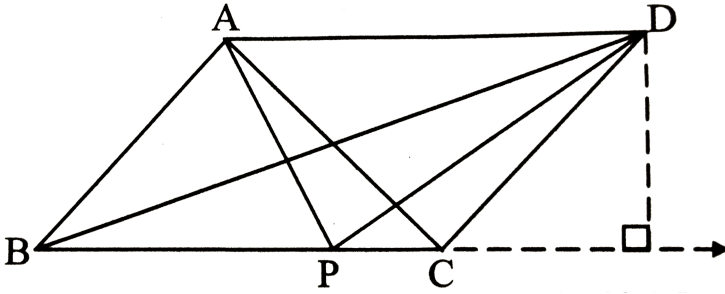
(iii) $A(\square DFGE)$

9. $\square ABCD$ is a parallelogram. P is any point on side BC. Find two

pairs of triangles with equal areas.

10. The ratio of the areas of two triangles with common base is 4:3.

Height of the larger triangle is 6 cm, then find the corresponding
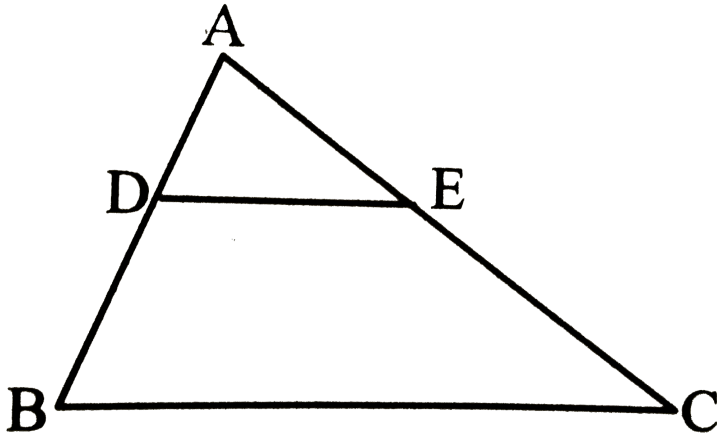
height of the smaller triangle.

11. The ratio of the areas of two triangles with the common base is 6:5. Height of the larger triangle is 9 cm. Find the corresponding height of the smaller triangle.

Additonal Problems For Practice Based On Practice Set 1 2

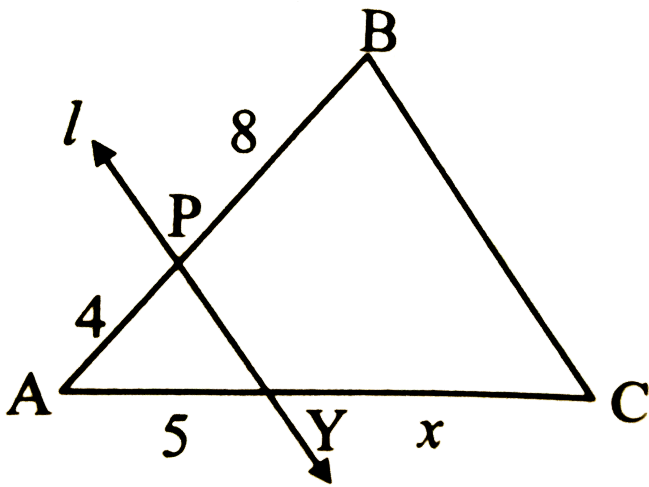**1.** In $\triangle ABC$, $DE\|BC$. If DB = 5.4 cm, AD = 1.8 cm, EC = 7.2 cm,

then find AE.

2. In the given figure, line l || side BC, AP = 4, PB = 8, AY = 5 and YC= x. Find x.

3. In the adjoining figure, seg EF|| side AC, AB = 18, AE = 10, BF = 4.

Find BC.
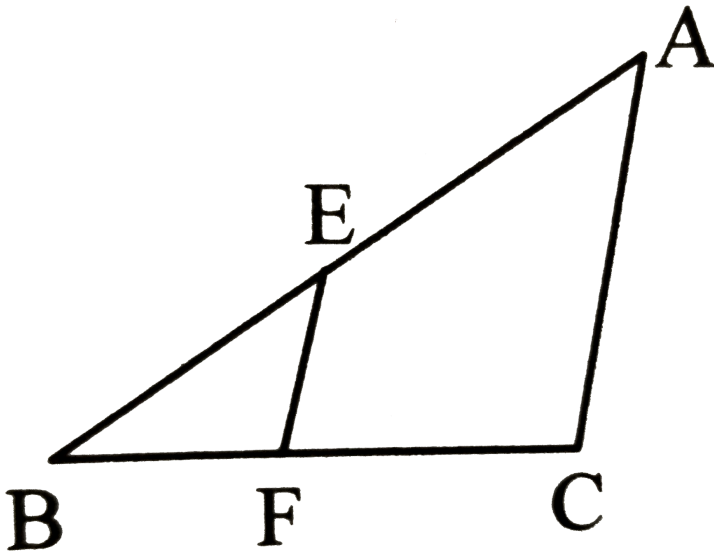
4. In the adjoining figure,seg DE||side AC and seg DC ||

side AP.

Prove that $\dfrac{BE}{EC} = \dfrac{BC}{CP}$.
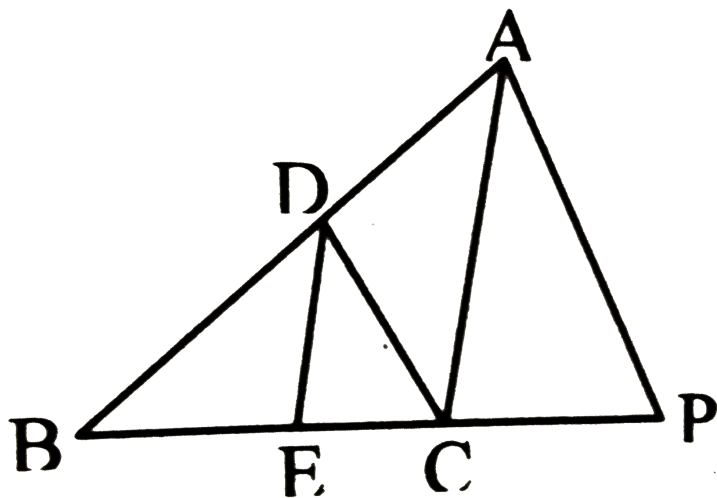
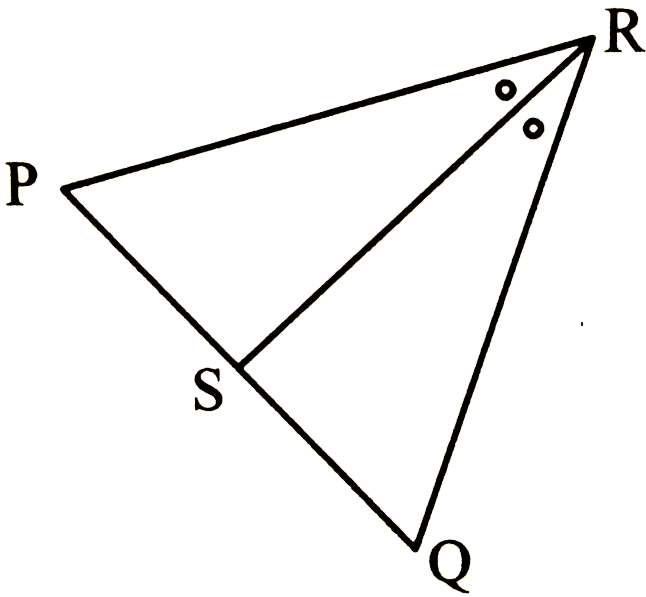**5.** In the adjoining figure, PM = 4.8, MR = 2.4, QN = 5.4, NR = 3.6.

State with reason whether seg MN is Parallel to side PQ

or not?
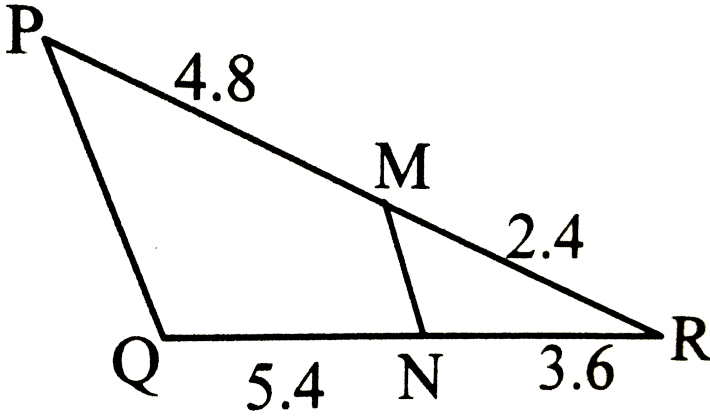
6. In $\triangle PQR$, seg RS bisects $\angle R$.if PR = 15, RQ = 20, PS = 12 , then find SQ.

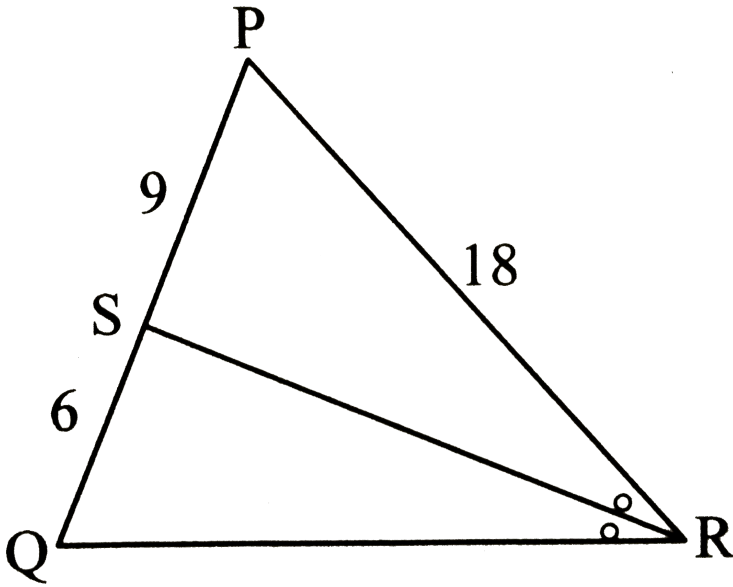**7.** In the following figure, in $\triangle PQR$, seg RS is the bisector of $\angle PRQ$, PS= 6, SQ=8, PR = 15, Find QR.

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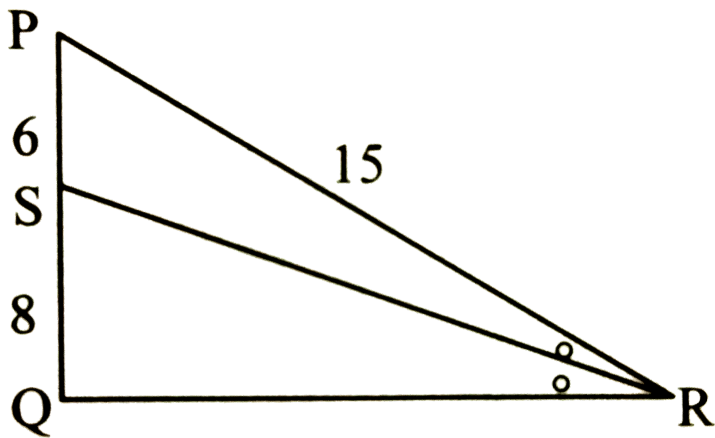
8. In the following figure, in $\triangle PQR$, seg RS is the bisector of $\angle PRQ$.

If PS = 9, SQ = 6, PR = 18, find QR.

9. In the following figure, ray PT is the bisector of $\angle QPR.$ Find the

value of x and perimeter of $\triangle PQR$.

Q 4 cm T   5 cm   R
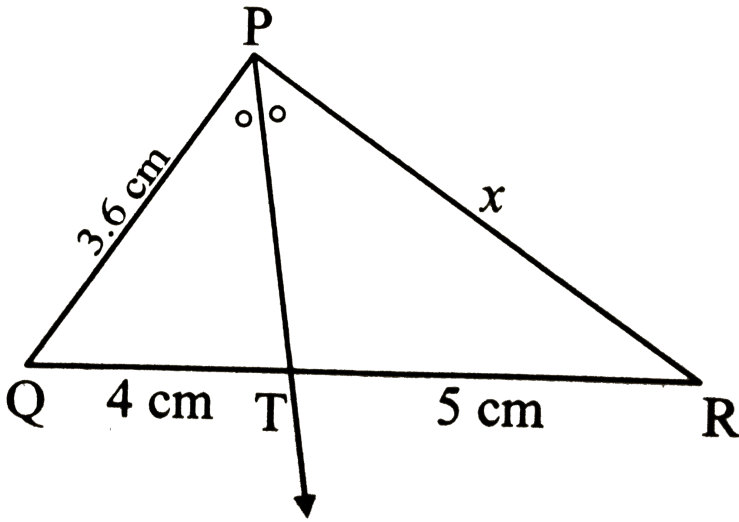
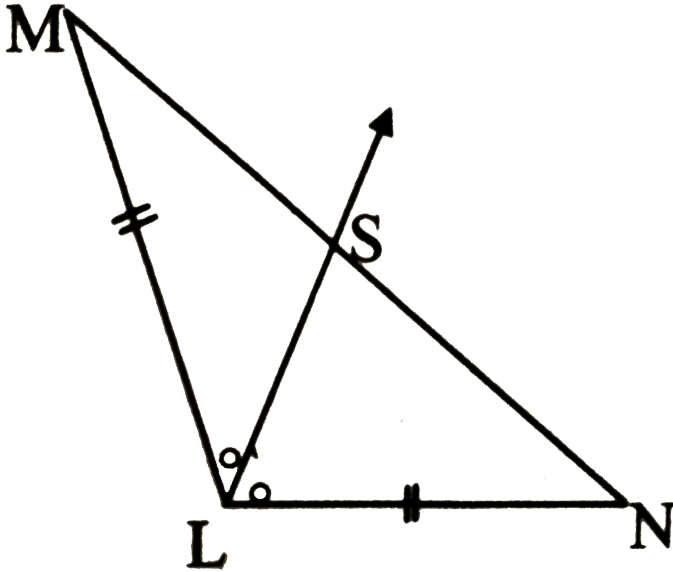**10.** In the given figure, ray LS is the bisector of $\angle MLN$,

and

$ML = LN.$ Find the relation between MS and SN.

11. In the adjoining figure, seg PS||seg QT||seg RU, PQ = 6.4, PR = 9.6

and ST = 11, then find the length of SU.
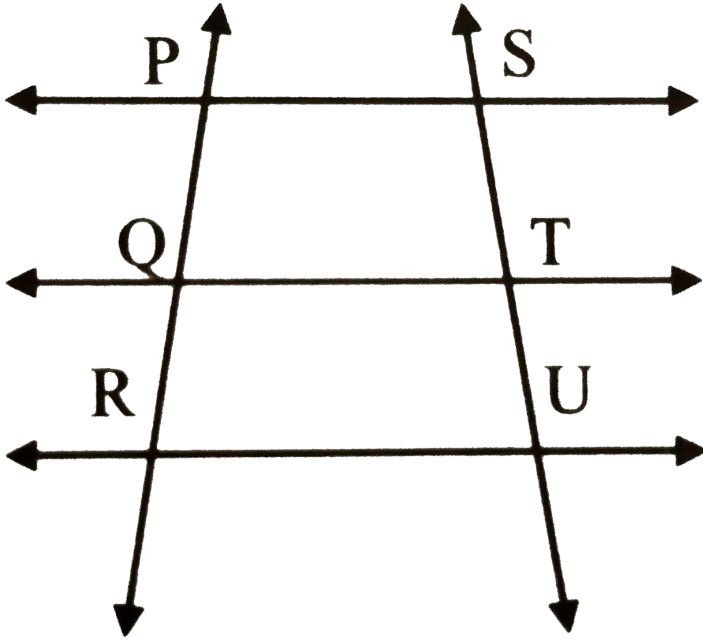
Additonal Problems For Practice Based On Practice Set 1 3

1. In $\Delta XYZ, \angle Y = 100°, \angle Z = 30°$. In $\Delta LMN, \angle M = 100°, \angle N = 30°$. Are ΔXYZ and ΔLMN similar? If yes, by which test?
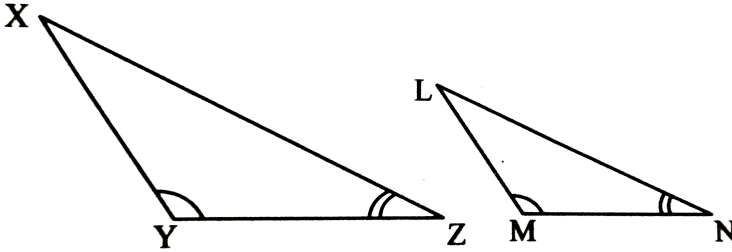
2. Are two triangles in the figure given below similar according to the information given? If yes, by which
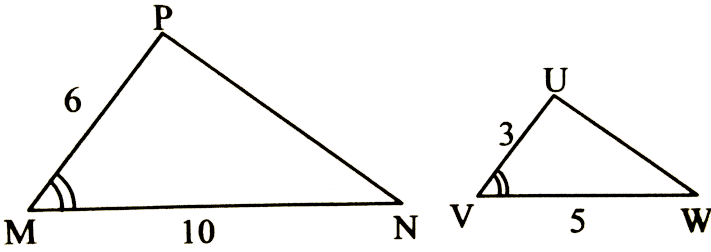
test?

3. Can we say that two triangles in the given figure are similar

according to the information given? If yes, by which

test?
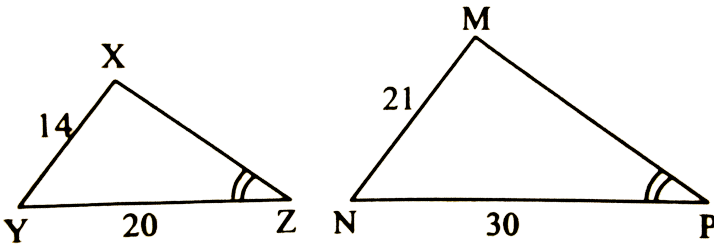
4. In the fiigure given below, which triagles are similar? Justify.
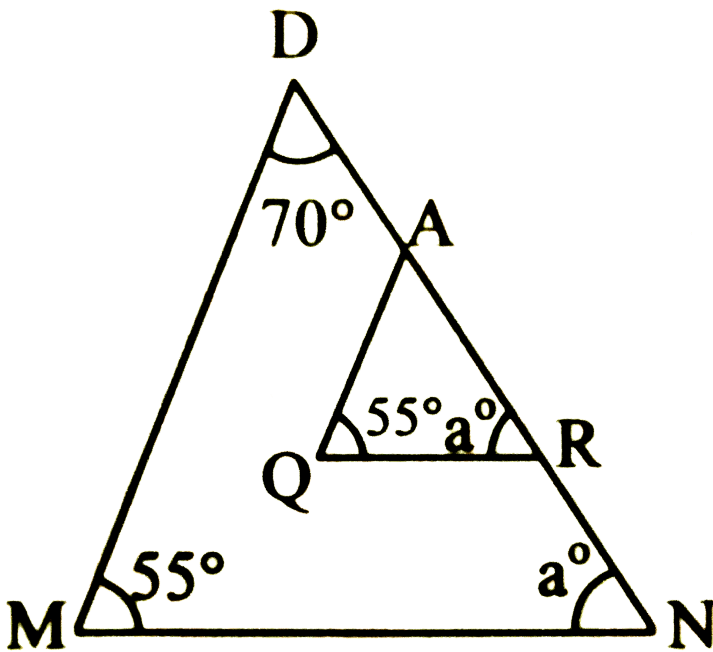
5. A street light bulb is fixed on a pole 6 m above the level of the street.

If a women of height 1.5 m casts a shadow of 3 m, then find how far she is away from the base of the pole.

6. Diagonals of a quadrilateral ABCD intersect in point Q.

if 2 QA = QC,

2 QB = QD, then prove that DC = 2 AB.

7. In $\square ABCD$, side $BC \mid\mid$ side AD. Digonals AC and BD intersect each other at P. If $AP = \dfrac{1}{3}AC$ then prove $DP = \dfrac{1}{2}BP$.

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1. $\triangle DEF \sim \triangle MNK$, if DE=5 and MN=6, then find the value of $A(\triangle DEF) : A(\triangle MNK)$.

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2. $\triangle ABC \sim \triangle PQR.$ If $A(\triangle ABC) = 25$, $A(\triangle PQR) = 16$ find $AB : PQ.$

3. If $\triangle PQR \sim \triangle PMN$ and $9A(\triangle PQR) = 16 A(\triangle PMN)$, then find $\dfrac{QR}{MN}.$

4. $\triangle LMN \sim \triangle RST$ and $A(\triangle LMN)$ = 100sq. Cm, $A(\triangle RST)$ = 144sq cm , LM = 5cm. Find RS.

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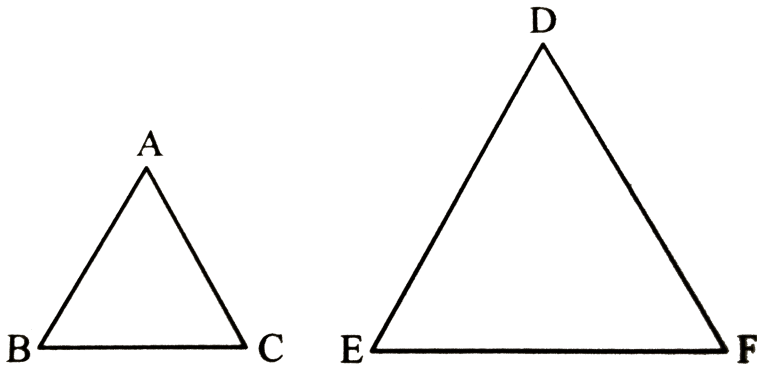
is 2 : 5.

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

what is the area

of the bigger triangle?

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6. $\triangle ABC$ and $\triangle DEF$ are equlateral triangles.

$A(\triangle ABC) : A(\triangle DEF)$ = 1 : 2. If AB = 4 , then what is

length of DE?

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

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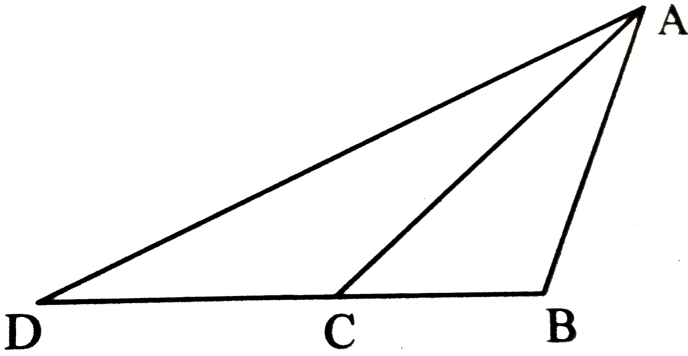
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Chapter Assessment

1. Choose the correct alternative.

In the given figure, if BC = 3cm and BD = 7 cm , then

$$\frac{A(\triangle ABC)}{A(\triangle ABD)} =$$

A. (a) $\dfrac{7}{3}$

B. (b) $\dfrac{10}{3}$

C. (c) $\dfrac{3}{7}$

D. (d) $\dfrac{3}{10}$
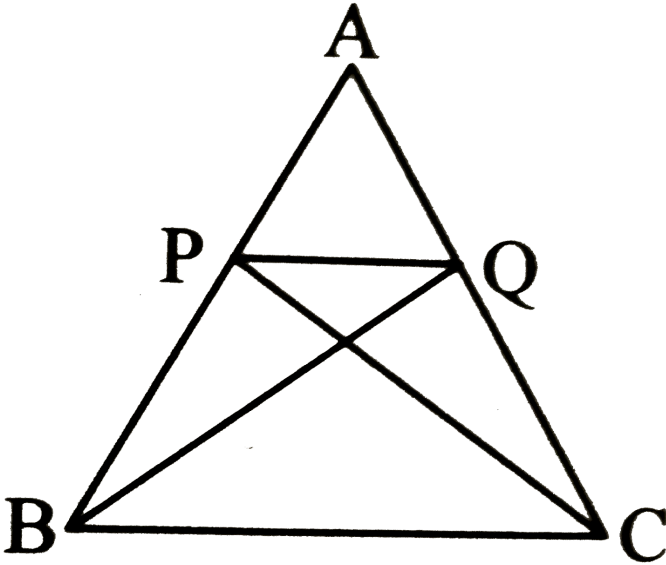
Answer: C

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2. Choose the correct alternative.

In the given figure, if seg PQ|| BC, then $\dfrac{A(\triangle BPQ)}{A(\triangle CQP)} =$

(a) $\dfrac{PQ}{BC}$ (b) $\dfrac{PQ}{QC}$ (c) $\dfrac{QC}{BP}$ (d) $\dfrac{1}{1}$

A. (a) $\dfrac{PQ}{BC}$

B. (b) $\dfrac{PQ}{QC}$

C. (c) $\dfrac{QC}{BP}$

D. (d) $\dfrac{1}{1}$

Answer: D

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3. Choose the correct alternative.

$\triangle ABC$ and $\triangle PQR$ are equilateral triangles. If $A(\triangle ABC) : A(\triangle PQR)$ = 1 : 16, and AB = 2 cm, then what is the length of PR?
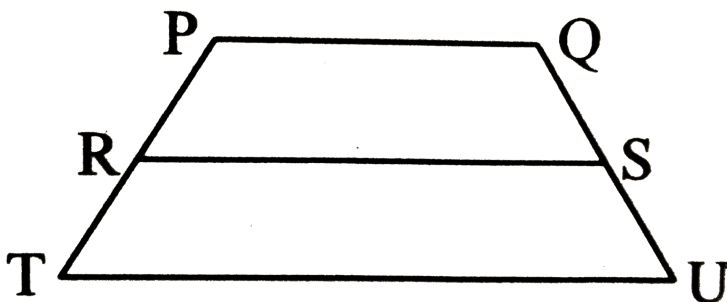
A. (a) 4 cm

B. (b) 2 cm

C. (c) 6 cm

D. (d) 8 cm

Answer: D

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4. Choose the correct alternative.

In the given figure, if seg PQ|| RS ||seg TU, and PR = 6, RT = 3, QS = 5, then what is the length of SU?

A. (a) 2.5 units

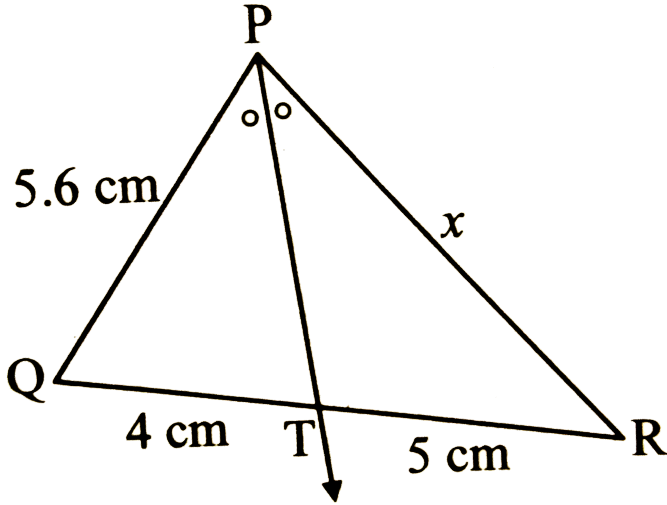B. (b) 7.5 units

C. (c) 10 units

D. (d) 1.5 units

Answer: A

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5.

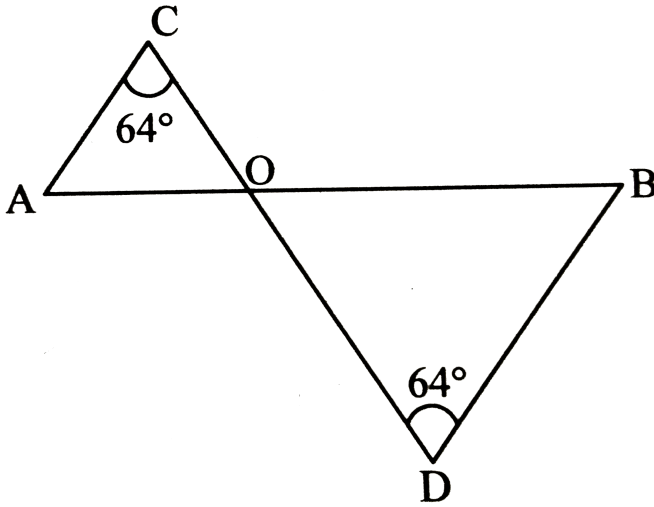In the given figure, ray PT is the bisector of $\angle QPR$.

Find the value of x.

6.

Are the triangle shown in the figure below similar? If so,

by which test of similarity?

7. Complete the following activities

The areas of two triangle with same base are in proportion of their corresponding height. To prove the theorem, answer the following

a. Draw two triangles, give names of all points,show

their bases.

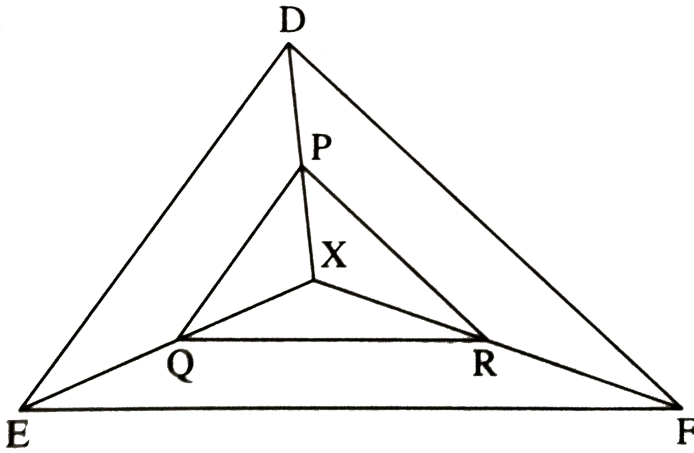b. Write ' given' and 'to prove' from the figures drawn.

8. In the figure X is any point in the interior of triangle.

Point X is joined

to vertices of triangle. Seg $PQ \mid\mid$ Seg DE, Seg $QR \mid\mid$

Seg EF.

Prove that Seg $PR \parallel$ Seg DF.

9. In the adoining figure, A - D - C and B - E -C . Seg DE $\parallel$ side AB. If AD = 5, DC = 3, BC = 6.4, then find BE.
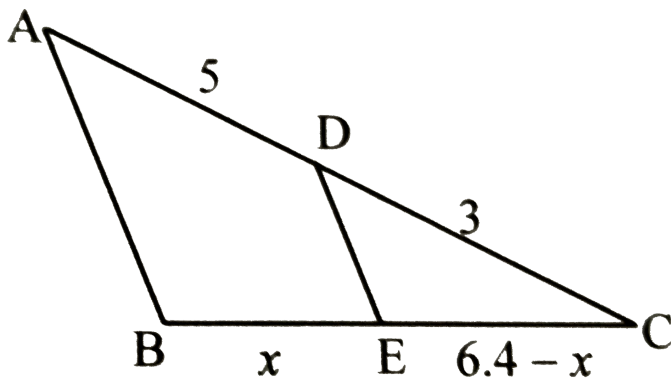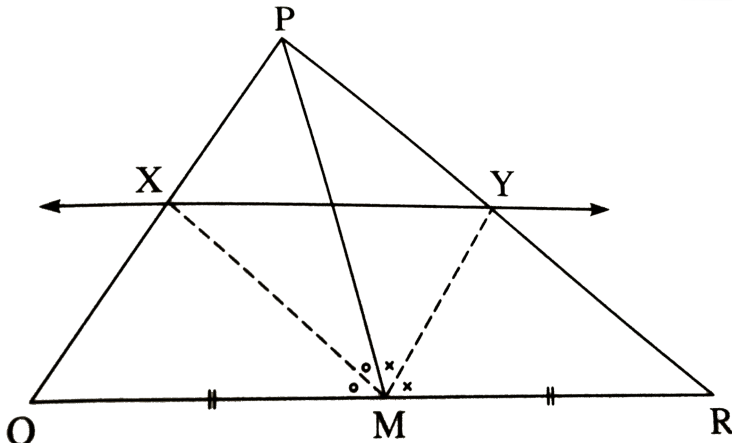
10. The ratio of the areas of two triangles with equal height is 3 : 4.

Base of the smaller triangle is 15 cm. Find the corresponding base of the large triangle.

11.

In $\triangle PQR$ seg PM is a median. Angle bisectors of $\angle PMQ$ and $\angle PMR$ interesect $side\,PQ$ and $side\,PR$ in points X and Y respectively. Prove that $XY \mid\mid QR$.

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12. Diagonals of a quadrilateral ABCD intersect in point Q. if 2 QA = QC,

2 QB = QD, then prove that DC = 2 AB.

13. Prove that , "If a line parallel to a side of a triangle

intersects the remaining sides in two distinct points

then the line divides the sides
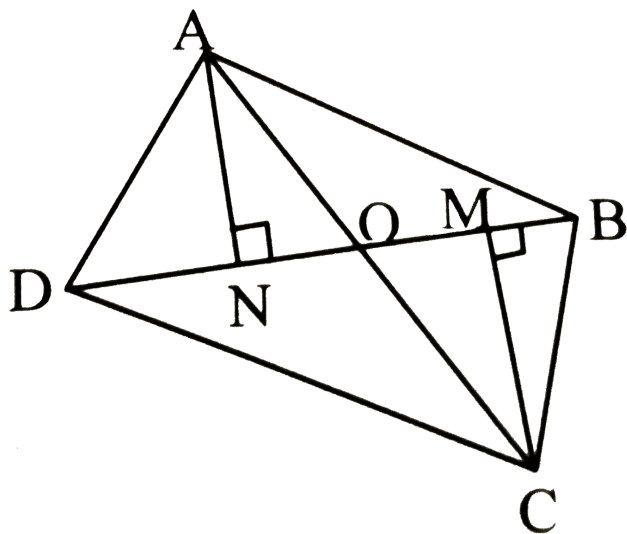
in the same proportion".

14. Slove the following questions.

In the figure, ΔADB and ΔCDB are drawn on the

same

base BD.if AC and BD intersect at O,

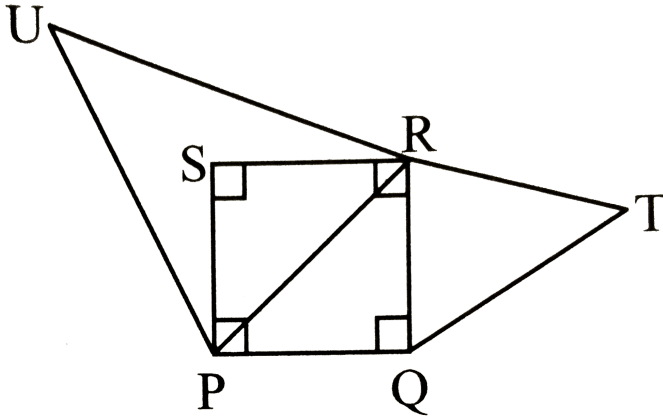then prove that $\dfrac{A(\triangle ADB)}{A(\triangle CDB)} = \dfrac{AO}{CO}$.

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15.

In the given figure, $\square PQRS$ is a square. If $\triangle QRT$ and $\triangle PRU$ are similar to each other, then

prove that $A(\triangle QRT) = \dfrac{1}{2} A(\triangle PRU)$.

16.

Prove that for a given correspondence, if three angles of one triangles are congruent to the corresponding three angles of the other triangle, then the two triangles are similar.

17. Prove:In a triangle the angle bisector divides the side

opposite to the angle in the ratio of the remaining

sides.