MATHS

BOOKS - UNIQUE MATHS (HINGLISH)

SIMILARITY

Example

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

A. $\dfrac{1}{2}$

B. $\dfrac{3}{4}$
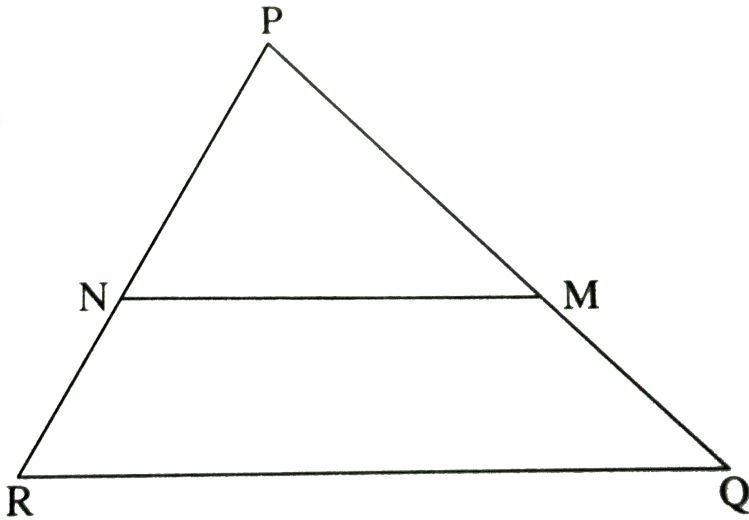
C. $\dfrac{5}{4}$

D. $\dfrac{1}{4}$

Answer: B

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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.

A. No, because NM is not dividing PR and PQ in

   equal proportion

B. yes

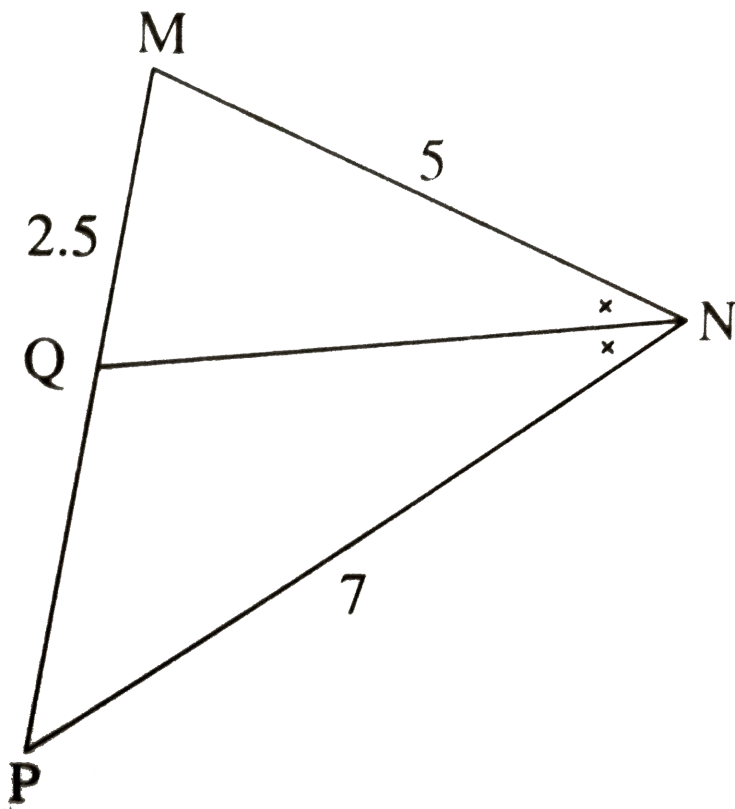C. No, NM is dividing PR and PQ in equal

   proportion

D. none

Answer: A

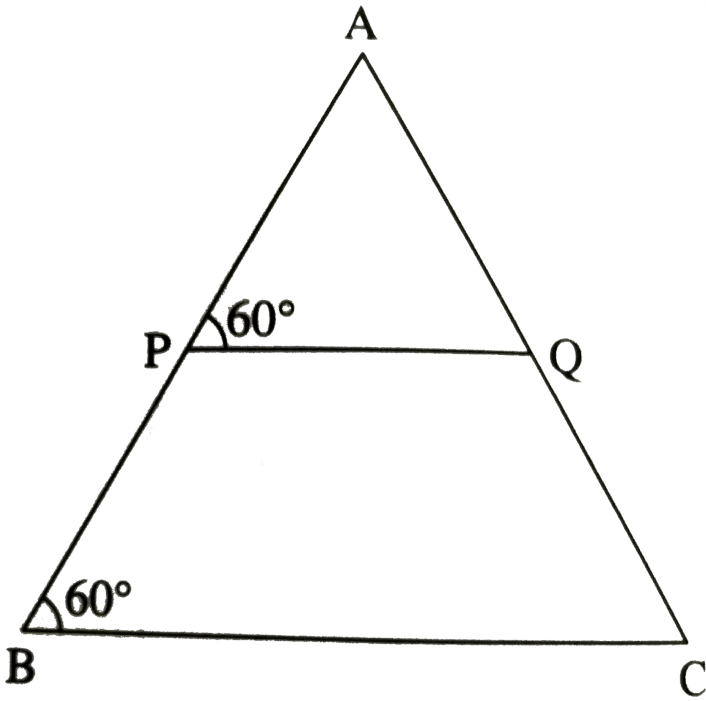**3.** In $\triangle MNP, NQ$ is a bisector of $\angle N$. If $MN = 5, PN = 7, MQ = 2.5,$ the find QP.

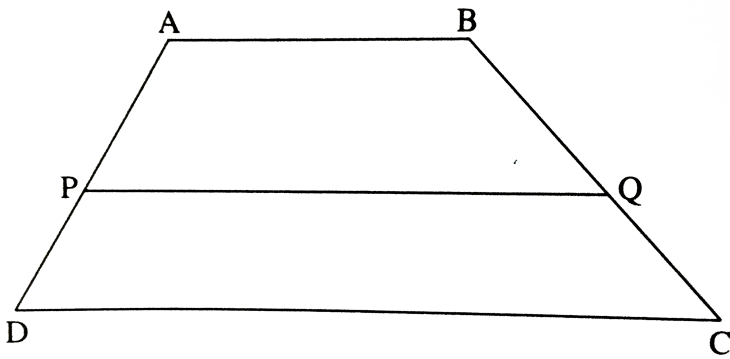**4.** Measures of some angles in the figures are given. Prove that $\dfrac{AP}{PB} = \dfrac{AQ}{QC}$

5. In trapezium ABCD side $AB \parallel$ side $PQ \parallel$ side DC, $AP = 15$, $PD = 12$, $QC = 14$, find BQ.
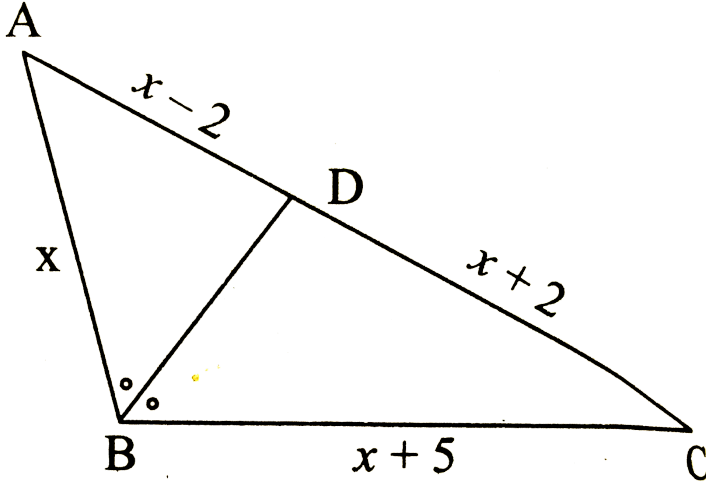
A. 14.5

B. 16.5

C. 17.5

D. 18.5

Answer: C

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6. In $\triangle ABC$, seg BD bisects $\angle ABC$. If $AB = x$, $BC = x + 5$, $AD = x - 2$, $DC = x + 2$. Find the value of x.

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7. 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.

8. Are the triangles in following figures similar?

If yes by which test?
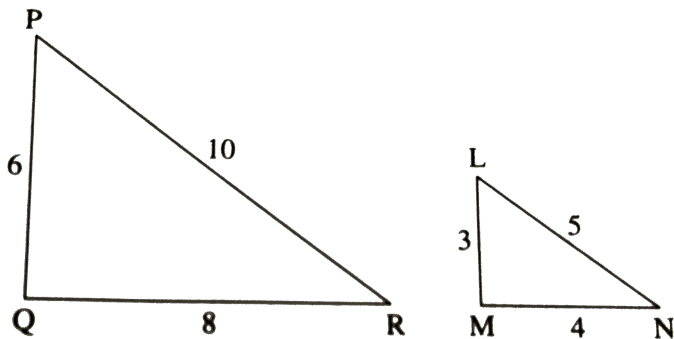
9. Kamala have drawn a trapezium $PQRS$ of which $PQ \mid \mid SR$. If the diagonals PR and QS intersect each other at O, then prove that $OP:OR = OQ:OS$, If $SR = 2PQ$, then prove that O is a point of trisection of both the diagonals.

10. The ratio of corresponding sides of similar triangles is $3:5$, then what is the ratio of their areas.

A. $\dfrac{3}{25}$

B. $\dfrac{9}{5}$

C. $\dfrac{3}{5}$

D. $\dfrac{9}{25}$

Answer: D

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11. If $\triangle ABC \sim \triangle PQR$ and $AB : PQ = 2 : 3$, then fill in the blanks:

$$\frac{A(\triangle ABC)}{A(\triangle PQR)} = \frac{(AB)^2}{\square} = \frac{2^2}{3^2} = \frac{\square}{\square}$$

$$\frac{A(\triangle ABC)}{A(\triangle PQR)} = \frac{AB^2}{PQ^2} = \frac{2^2}{3^2} = \frac{4}{9}$$

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12. 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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13. $\Delta LMN \sim \Delta PQR,$

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

then find MN.

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14. Areas of two similar triangles are $225 sqcm$ and

$81 sqcm$. If a side of the smaller triangle is $12 cm$,

then find the corresponding side of the bigger

triangle.

    A. $20 cm$

    B. $21 cm$

C. $22cm$

D. $23cm$

Answer: A

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

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16. Ratio of areas of two triangles with equal height is $2:3$. If base of the smaller triangle is 6 cm, the what is the corresponding base of the bigger triangle?
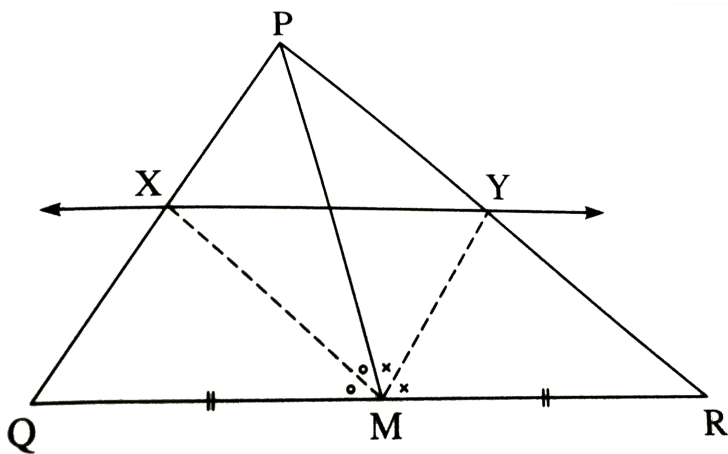
17. $\Delta MNT \sim \Delta QRS$. Length of altitude drawn from point T is 5 and length of altitude drawn from point S is 9. Find the ratio $\dfrac{A(\Delta MNT)}{A(\Delta QRS)}$.
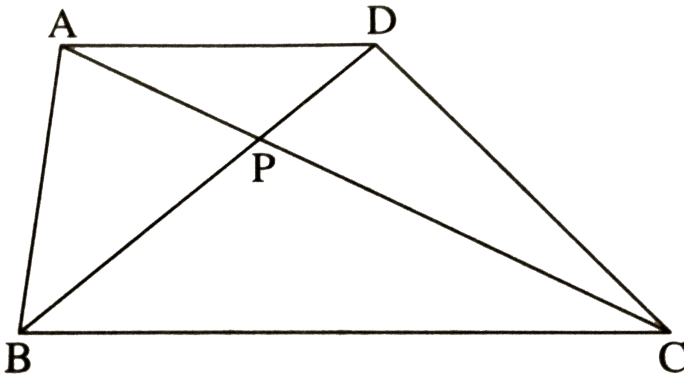
18.

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 $XY \mid\mid QR$.

Complete the proof by filling in the boxes:

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19. In $\square ABCD$, seg $AD \parallel$ seg BC. Diagonal AC and digonal BD intersect each other in point P. Then show that $\dfrac{AP}{PD} = \dfrac{PC}{BP}$.

20. In $\triangle ABC$, seg $DE \parallel$ side BC. If $2Ar(\triangle ADE) = Ar(\square DBCE)$, find $AB : AD$

and show $BC = \sqrt{3} \times DE.$

21. Lex X by any point on the side BC of a triangle ABC. If XM, XN are drawn parallel to BA and CA meeting CA, BA in M, N respectively; MN meets BC produced in T, prove that $TX^2 = TB \times TC$

22. Two poles of height a metres and b metres are p metres apart. Prove that the height of the point of

intersection of the lines joining the top of each pole to the foot of the opposite pole is given by $\dfrac{ab}{a+b}$ metres.

Unique Practise Session Mcqs

1. Sides of two similar triangles are in the ratio $4:9$. Areas of these triangles are in the ratio. $2:3$ (b) $4:9$ (c) $81:16$ (d) $16:81$

A. $2:3$

B. $4 : 9$

C. $81 : 16$

D. $16 : 81$

Answer:

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2. The areas of two similar triangles are in respectively $9\ cm^2$ and $16\ cm^2$. Then find the ratio of their corresponding sides.

A. $3 : 4$

B. $4:3$

C. $2:3$

D. $4:5$

Answer: A

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3. A vertical stick 20 m long casts a shadow 10m long on the ground. At the same time, a tower casts a shadow 50m long on the ground. The height of the tower is (a) 100m (b) 120m (c) 25m (d) 200m

A. $100m$

B. $120m$

C. $25m$

D. $200m$

Answer:

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4. Two isosceles triangles have equal angles and their areas are in the ratio $16:25$. The ratio of their corresponding heights is $4:5$ (b) $5:4$ (c) $3:2$ (d) $5:7$

A. $4:5$

B. $5:4$

C. $3:2$

D. $5:7$

Answer:

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5. If ABC and DEF are similar triangles such that

$AB = 3cm,$ $BC = 2cm,$ $CA = 2.5cm$ and

$EF = 4cm.$ Write the perimeter of $\triangle DEF$.

A. $7.5cm$

B. $15cm$

C. $22.5cm$

D. $30cm$

Answer: B

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Unique Practise Session 1 Marks Question

1. SAS Similarity Criterion : If in two triangle; one pair of corresponding sides are proportional and

the included angles are equal then two triangles are similar.

2. The ratio of corresponding sides of similar triangles is $5:7$, then what is the ratio of their areas?

3. Two sides and the perimeter of one triangle are respectively three times the corresponding sides

and the perimeter of the other triangle. Are the two triangles similar? Why?

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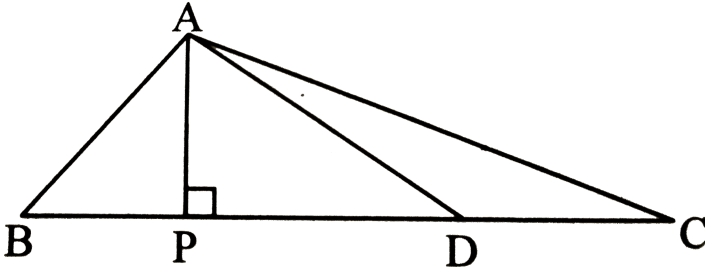## Unique Practise Session 2 Marks Question

1. 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) $A(\triangle ABD) : A(\triangle ADC)$.

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

Unique Practise Session 3 Marks Question

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

2. In Fig. 4.241, $DEBC$ and $AD = \dfrac{1}{2}BD$. If $BC = 4.5cm$, find DE .(FIGURE)

Unique Practise Session 4 Marks Question

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

2. If one diagonal of a trapezium divides the other diagonal in the ratio 1:2, prove that one of the parallel lines is double the other.

Assignment I
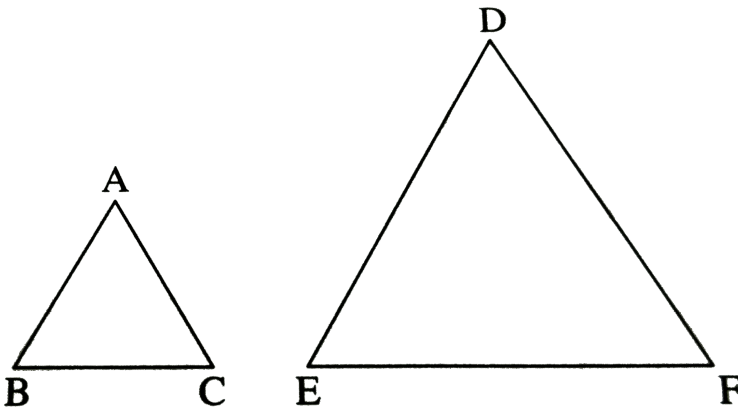
1. $\triangle ABC$ and $\triangle DEF$ are equilateral triangles,

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

If $AB = 4$ then what is length of DE?

A. $2\sqrt{2}$

B. 4

C. 8

D. $4\sqrt{2}$

Answer:

2. If ABC and DEF are similar such that $2\,AB = DE$ and $BC = 8cm$, then $EF =$ (a) 16cm (b) 12cm (c) 8cm (d) 4cm.

A. $16cm$

B. $12cm$

C. $8cm$

D. $4cm$

Answer:

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

4. 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.

5. 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".