MATHS

BOOKS - CBSE COMPLEMENTARY MATERIAL MATHS (HINGLISH)

TRIANGLE

Very Short Answer Type Questions Fill In The Blanks

1. Area of an equilateral triangle

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2. If $\triangle ABC \sim \triangle FED$, then $\frac{AB}{-} = \frac{-}{ED}$.

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3. Circles having saem radii are ..

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4. Theorem 6.1 : If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

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5. Theorem 6.8 : In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

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Very Short Answer Type Questions State True Or False

1. All the similar figures are congruent if their areas are equal. (Yes/No).

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2. State the basic proportionality theorem.

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3. Thales Theorem (Basic Proportionality Theorem)

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4. Pythagoras Theorem

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5. 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) $16:81$

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6. Match the Following:

Column I	Column II
(*a*) If corresponding angles are equal in two triangles, then the two triangles are similar.	(*i*) SAS similarity criterion
(*b*) If sides of one triangle are proportional to the sides of the other triangle, then the two triangles are similar.	(*ii*) ASA similarity criterion
(*c*) If one angle of a triangle is equal to one angle of the other triangle and the sides including these angles are proportional, then the two triangles are similar.	(*iii*) AAA similarity criterion
	(*iv*) SSS similarity criterion

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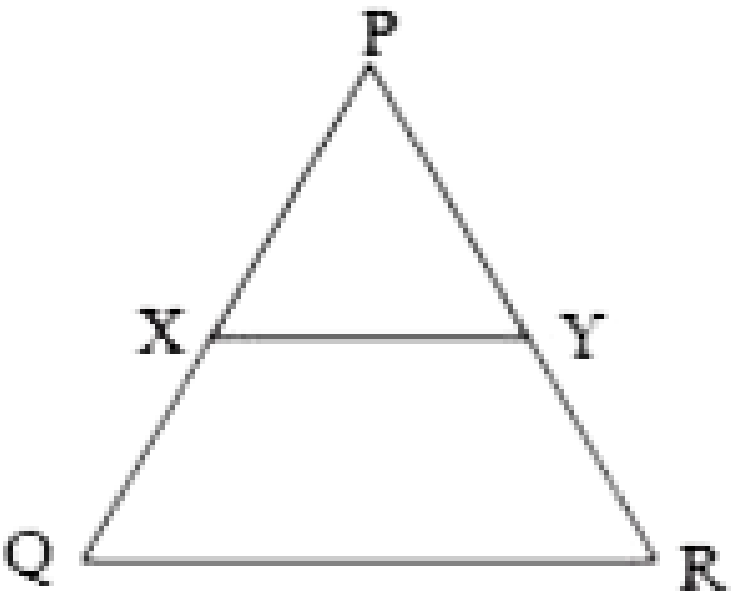
7. In the following figure, $XY \mid\mid QR$ and $\frac{PX}{XQ} = \frac{PY}{YR} = \frac{1}{2}$ then



A. XY=QR

B. $XY = \frac{1}{3}QR$

C. $XY^2 = QR^2$

D. $XY = \frac{1}{2}QR$

Answer: A::C

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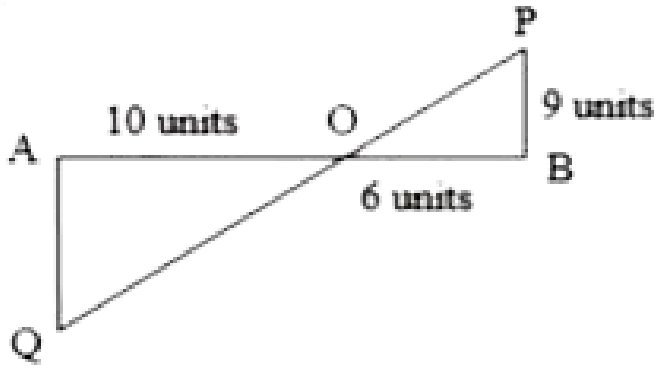
8. In the following figure, $QA \perp AB$ and $PB \perp AB$, then AQ is



A. 15 units

B. 8 units

C. 5 units

D. 9 units

Answer: A

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9. Theorem 6.6 : The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

A. ratio of their corresponding sides.

B. ratio of their corresponding altitudes.

C. ratio of the square of their corresponding sides.

D. ratio of their perimeter.

Answer: A::C::D

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10. The areas of two similar triangles are $144cm^2$ and $81cm^2$. If one median of the first triangleis 16 cm, length of corresponding median of the second triangle is

A. 9 cm

B. 27 cm

C. 12 cm

D. 16 cm

Answer: A::B::C

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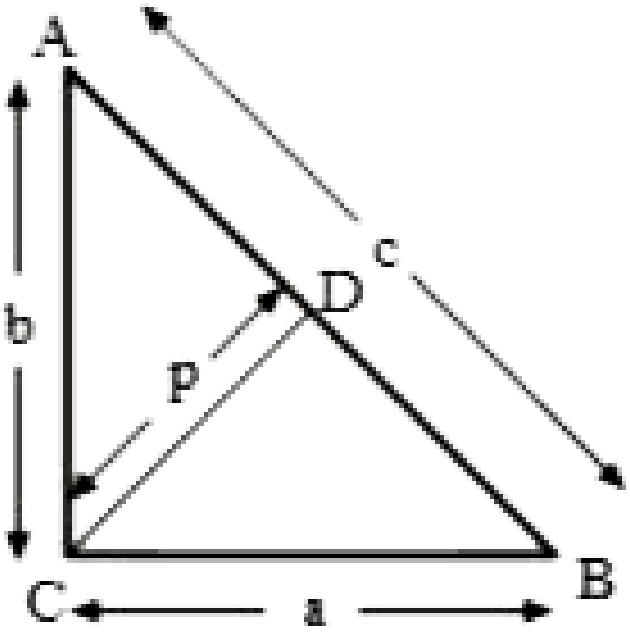
11. In a right triangle ABC, in which $\angle C = 90^\circ amd CD \perp AB$. If BC =a, CA=b, AB=c and CD=p, then



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

B. $\frac{1}{p^2} \neq \frac{1}{a^2} + \frac{1}{b^2}$

C. $\frac{1}{p^2} < \frac{1}{a^2} + \frac{1}{b^2}$

D. $\frac{1}{p^2} > \frac{1}{a^2} + \frac{1}{b^2}$

Answer: A::B

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12. If $\triangle ABC \sim \triangle DEF, ar(\triangle DEF) = 100cm^2$ and $\frac{AB}{DE} = \frac{1}{2}$, then ar(DA

A. $50cm^2$

B. $25cm^2$

C. $4cm^2$

D. $200cm^2$

Answer: B::C

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13. If the three sides of a triangle are a, $\sqrt{3}a$ and $\sqrt{2}a$, then the measure of the angle opposite to longest side is

A. 45°

B. 30°

C. 60°

D. 90°

Answer:

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14. vertical pole of length 3 m casts a shadow of 7 m and a tower casts a shadow of 28 m at a time. The height of tower is

A. 10 m

B. 12 m

C. 14 m

D. 16 m

Answer: A::B::C

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15. The lengths of the diagonals of a rhombus are 16 cm and 12 cm. Then, the length of the side of the rhombus is

A. 9 cm

B. 10 cm

C. 8 cm

D. 20 cm

Answer: A::C

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16. If $\triangle ABC \sim \triangle EDF$ and $\triangle ABC$ is not similar to $\triangle DEF$, then which of the following is not true?

A. BC.EF = AC.FD

B. AB.EF = AC.DE

C. BC.DE = AB.EF

D. BC.DE = AB.FD

Answer: C

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17. Pythagoras theorem

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18. State the basic proportionality theorem.

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19. Is the triangle with sides 12 cm, 16 cm and 18 cm a right triangle?

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20. If $\triangle ABC \sim \triangle QRP, \frac{\text{Area } (\triangle ABC)}{\text{Area}(\triangle PQR)} = \frac{9}{4}, AB = 18cm, BC = 15cm$, then find the length of PR.

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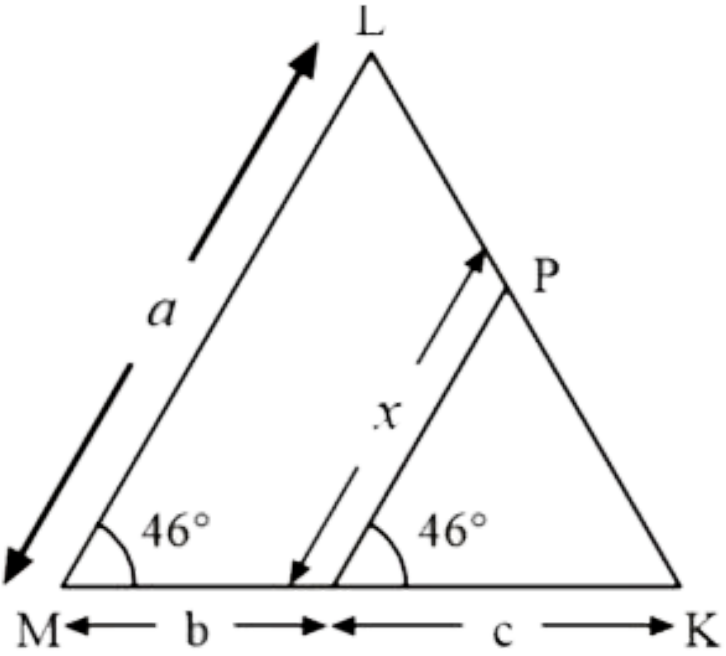
21. In the given Fig., $\angle M = \angle N = 46^\circ$, Express x in terms of a, b and c.



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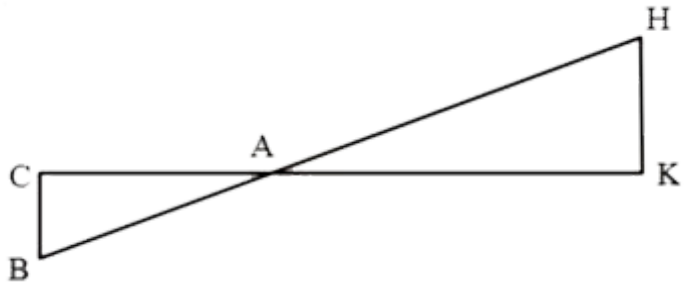
22. In the given Fig. $\triangle AHK \sim \triangle ABC$. If AK=10cm, BC=3.5 cmj and HK=7CM, find AC



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23. It is given that $\Delta DEF \sim \Delta RPQ$. Is it true to say that $\angle D = \angle R$ and $\angle F = \angle P$? Why?

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24. If the corresponding Medians of two similar triangles are in the ratio 5 : 7. Then find the ratio of their sides.

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25. An aeroplane leaves an airport and flies due west at a speed of 2100 km/hr. At the same time, another aeroplane leaves the same place at airport and flies due south at a speed of 2000 km/hr. How far apart will be the two planes after 1 hour?

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26. The areas of two similar $\triangle ABC$ and $\triangle DEF$ are $225cm^2$ and $81cm^2$ respectively. If the longest side of the larger triangle $\triangle ABC$ be 30 cm, find the longest side of the smaller triangle DEF.

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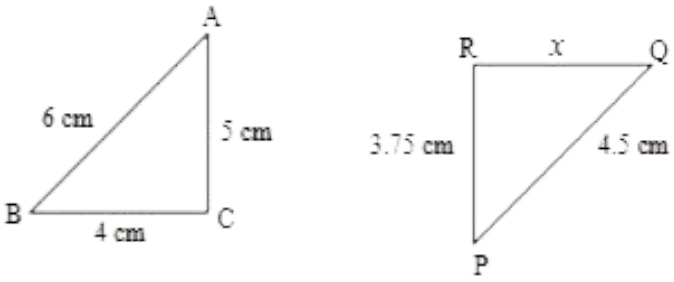
27. In the given figure, if $\triangle ABC \sim \triangle PQR$, find the value of x?



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28. In the given figure, XY ||QR and $\frac{PX}{XQ} = \frac{PY}{YR} = \frac{1}{2}$, find $\mathrm{XY} : \mathrm{QR}$.

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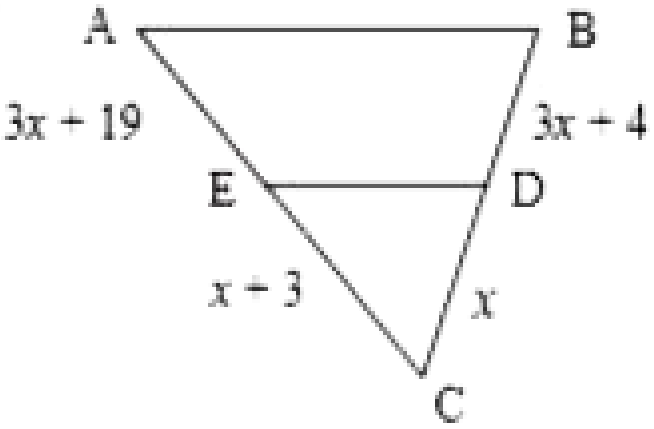
29. In the given figure, find the value of x which will make DE||AB ?



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30. If $\triangle ABC \sim \triangle DEF, BC = 3EF$ and $ar(DABC) = 117cm^2$ find area ($\triangle DEF$).

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31. If $\triangle ABC$ and $\triangle DEF$ are similar triangles such that $\angle A = 45^\circ$ and $\angle F = 56^\circ$, then find angle C

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32. If the ratio of the corresponding sides of two similar triangles is 2 : 3, then find the ratio of their corresponding attitudes.

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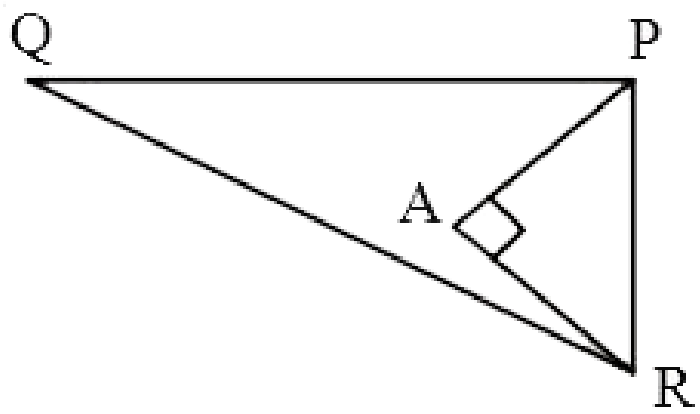
Short Answer Type Questions I

1. In the given Fig. PQ= 24 cm, QR= 26 cm, $\angle PAR = 90^\circ$, PA =6 cm and AR= 8 cm, find $\angle QPR$.



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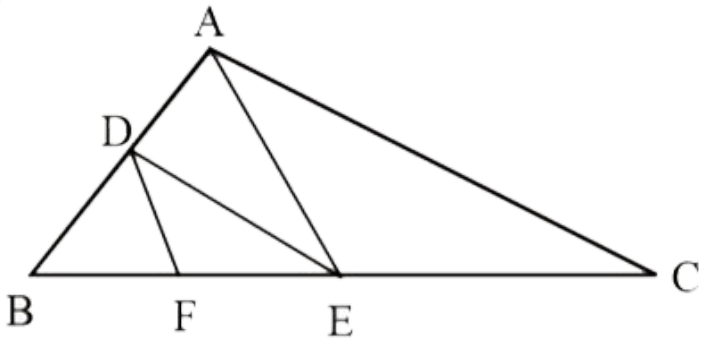
2. In the given Fig., DE || AC and DF || AE. Prove that $\frac{FE}{BF} = \frac{EC}{BE}$



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3. In a ABC, $AD \perp BC$ and $AD^2 = BD \times CD$. Prove that ABC is a right triangle.

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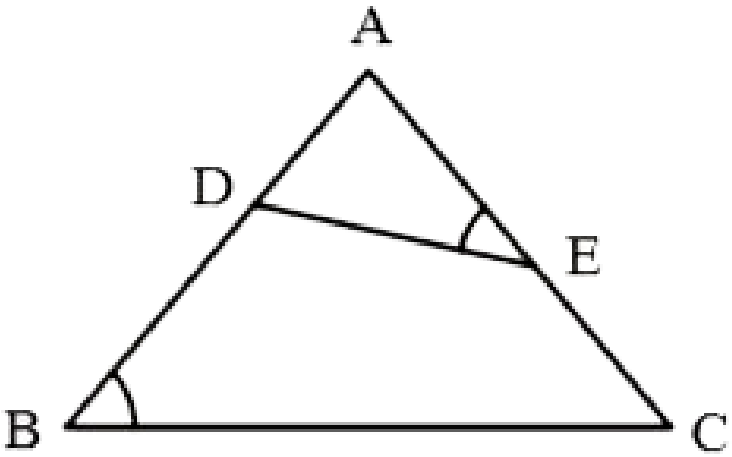
4. In the given Fig., D and E are points on sides AB and CA of $\triangle ABC$ such that $\triangle B = \angle AED$. Show that $\triangle ABC \sim \triangle AED$.



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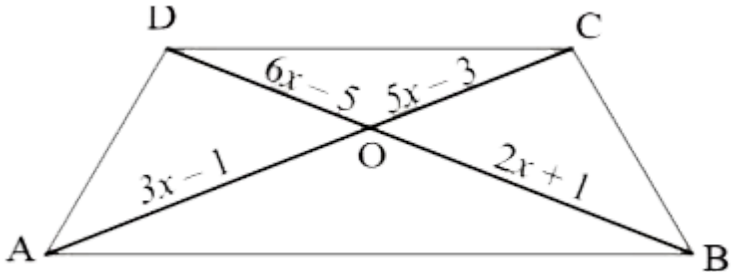
5. In the given fig., AB || DC and diagonals AC and BD intersects at O. If OA =3x-1 and OB =2x + 1, OC = 5x-3 and OD =6x-5, find the value of x.



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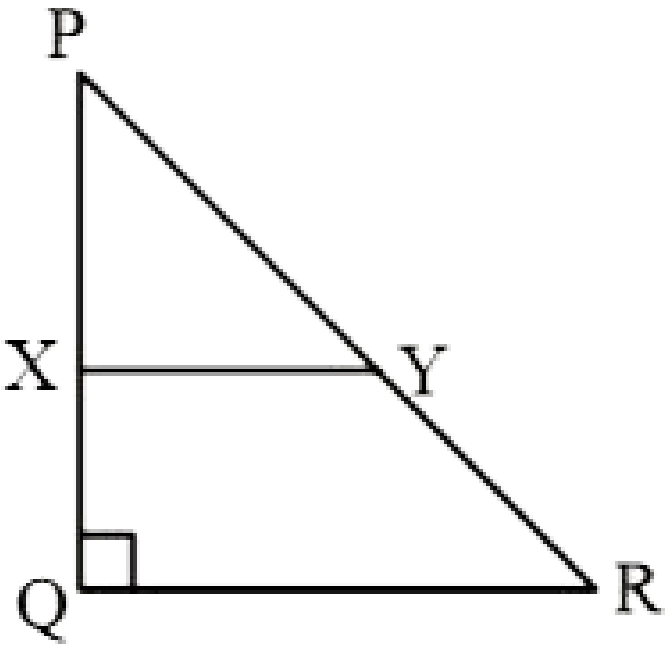
6. In the given Fig. PQR is a triangle, right angled at Q. If XY || QR, PQ =6 cm, PY= 4 cm and PX : XQ= 1 : 2. Calculate the lengths of PR and QR.



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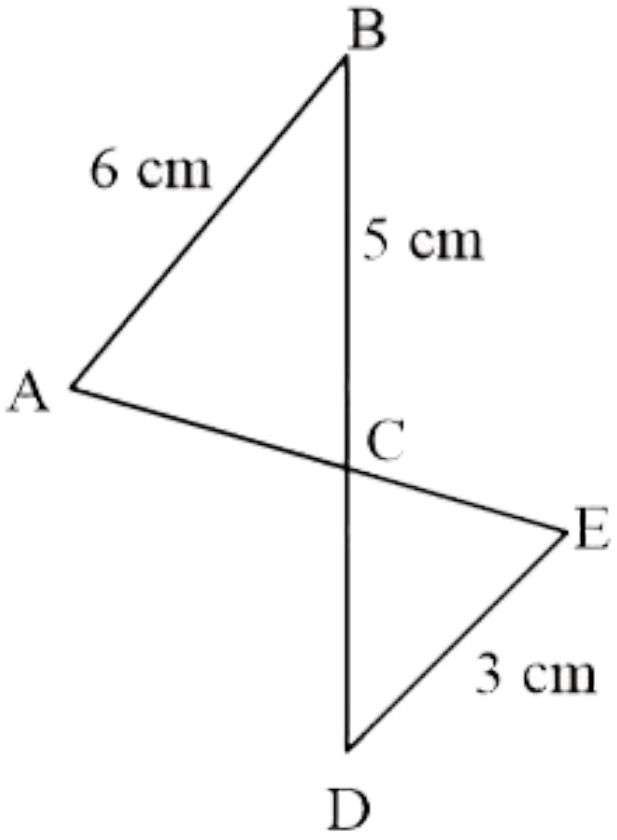
7. In the given figure, AB || DE. Find the length of CD.



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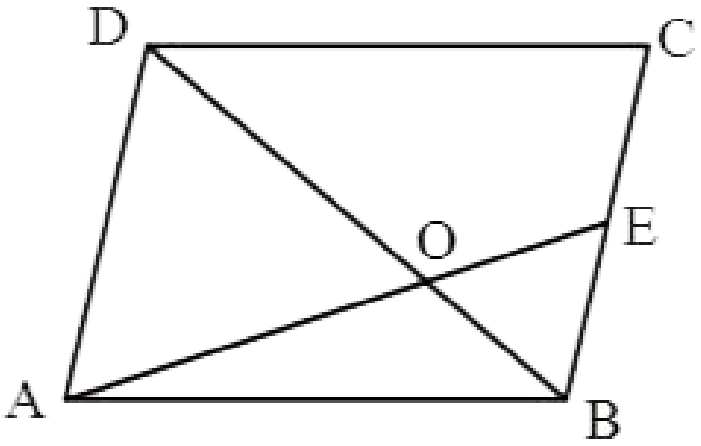
8. In the given figure, ABCD is a parallelogram. AE divides the line segment BD in the ratio 1 : 2. If BE = 1.5 cm find BC.



A. 2

B. 3

C. 5

D. 7

Answer: 3

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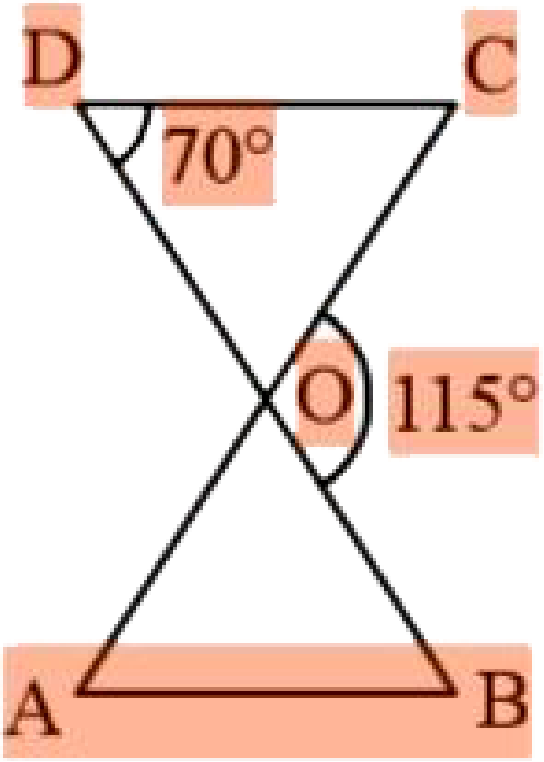
9. In the given figure, $\triangle ODC \sim \triangle OBA, \angle BOC = 115^\circ$ and $\angle CDO = 70.$ Find, (i)

$\angle DOC$, $(ii)\angle DCO$, $(iii)\angle OAB$, $(iv)\angle OBA$.



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10. Perimeter of two equilateral triangles ABC and PQR are 144 m and 96 m, Find ar $(\triangle ABC) : ar(\triangle PQR)$.

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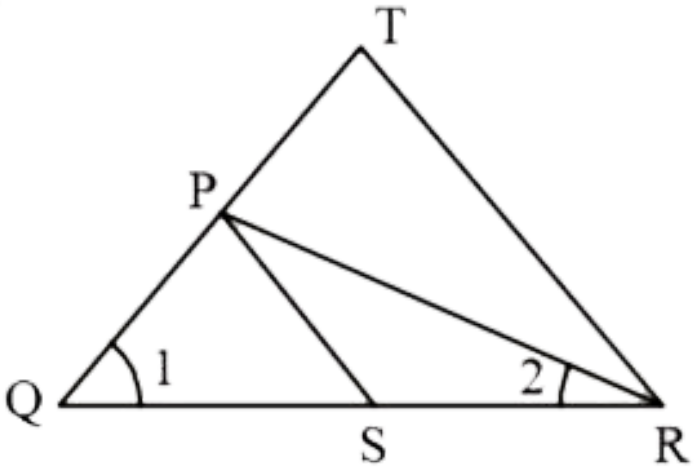
Short Answer Type Questions Ii

1. In the given figure, $\frac{QR}{QS} = \frac{QT}{PR}$ and $\angle 1 = \angle 2$ then prove that $\triangle PQS \sim \triangle TQR$.



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2. In equilateral $\triangle ABC$, $AD \perp BC$. Prove that $3BC^2 = 4AD^2$.

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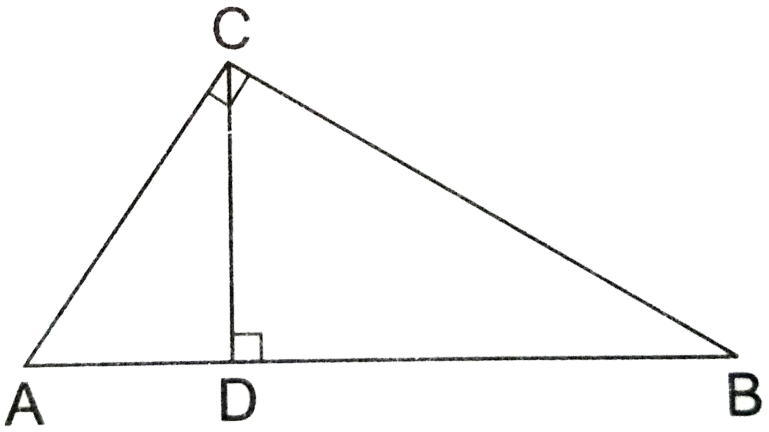
3. In the given figure $\angle ABC = 90^\circ$ and $CD \perp AB$. Prove that $\frac{BC^2}{AC^2} = \frac{BD}{AD}$



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4. In Fig. 4.179, ABC and DBC are on the same base BC. If AD and BC intersect at O, prove that $\frac{Area\ (ABC)}{Area\ (DBC)} = \frac{AO}{DO}$ (FIGURE)

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5. If AD and PS are medians of $\triangle ABC$ and $\triangle PQR$ respectively where $\triangle ABC \sim \triangle PQR$, Prove that $\frac{AB}{PQ} = \frac{AD}{PS}$.

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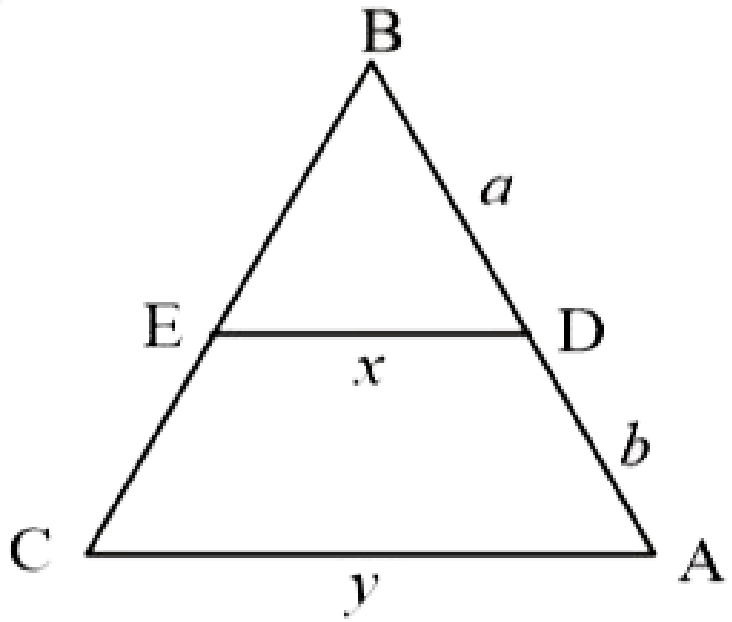
6. In the given figure, DE || AC. Which of the following is correct?

$x = \frac{a+b}{ay}$ or $x = \frac{ay}{a+b}$



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

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8. 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.

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9. 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 $\frac{ab}{a+b}$ metres.

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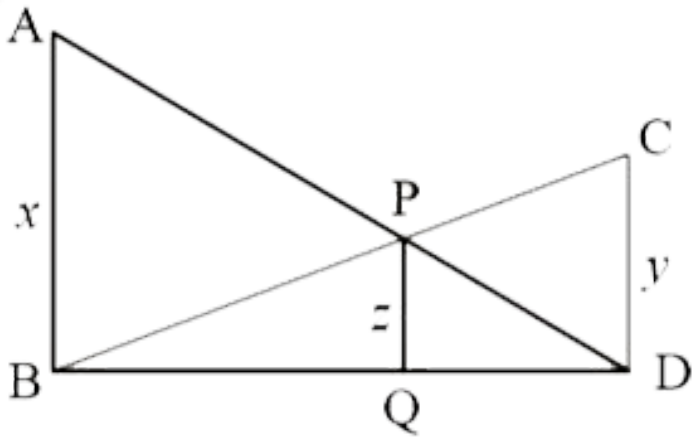
10. In the given figure AB || PQ || CD, AB=x, CD=y and PQ=z. Prove that



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

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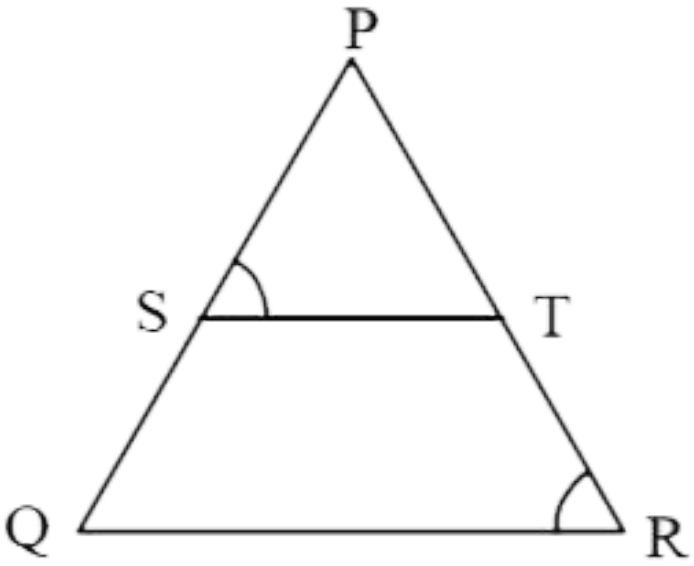
11. In the given figure $\frac{PS}{SQ}=\frac{PT}{TR}$ and $\angle PST=\angle PRQ$. Prove that PQR is an isoscles triangle.



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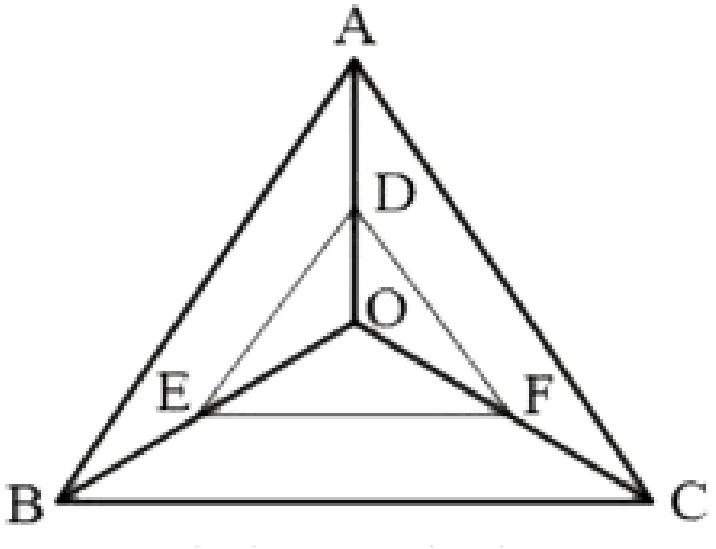
12. In the figure, a point O inside $\triangle ABC$ is joined to its vertices. From a point D on AO, DE is drawn parallel to AB and from a point E on BO, EF is

drawn parallel to BC. Prove that DF || AC.



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13. Two triangles $BACandBDC$, right angled at $AandD$ respectively, are drawn on the same base BC and on the same side of BC . If AC and DB intersect at P, prove that $APxPC = DPxPB$.

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14. The Hypotenuse of a right triangle is 25 cm and out of the remaining two sides, one is larger than the other by 5 cm, find the lenghts of the other two sides.

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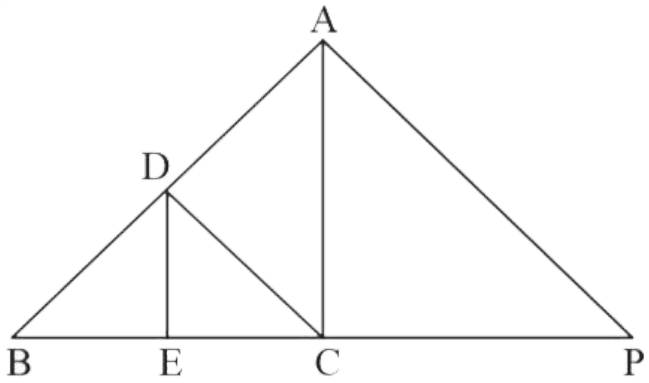
15. In the given figure DE || AC and $\frac{BE}{EC} = \frac{BC}{CP}$. Prove that DC || AP.



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16. In a quadrilateral ABCD, $\angle B = 90^\circ$ and $AD^2 = AB^2 + BC^2 + CD^2$ prove that $\angle ACD = 90^\circ$.

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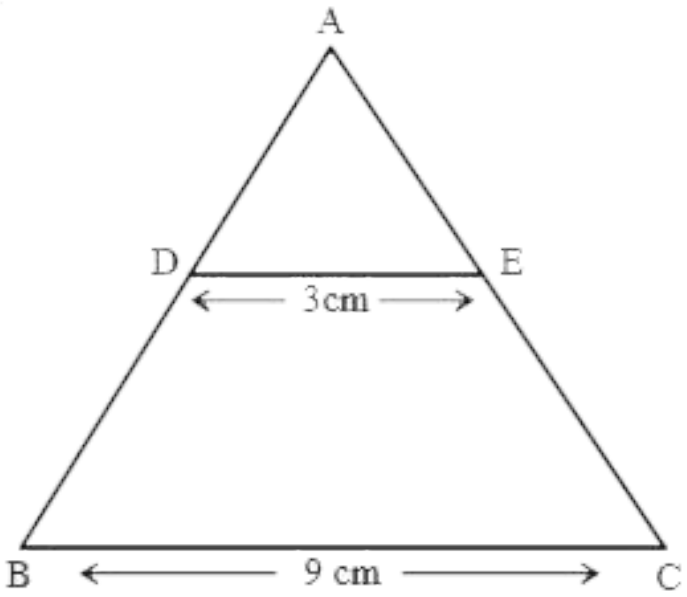
17. In the given figure, DE || BC, DE= 3 cm, BC = 9 cm and ar (DADE) = $30cm^2$.

Find ar (BCED).



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18. 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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19. Ii ΔPQR, PD $\perp$ QR such that D lies on QR, if PQ=a,PR=b,QD=c and DR=d, then prove that (a+b)(a-b)=(c+d)(c-d).

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20. The ratio of the the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides/altitudes.

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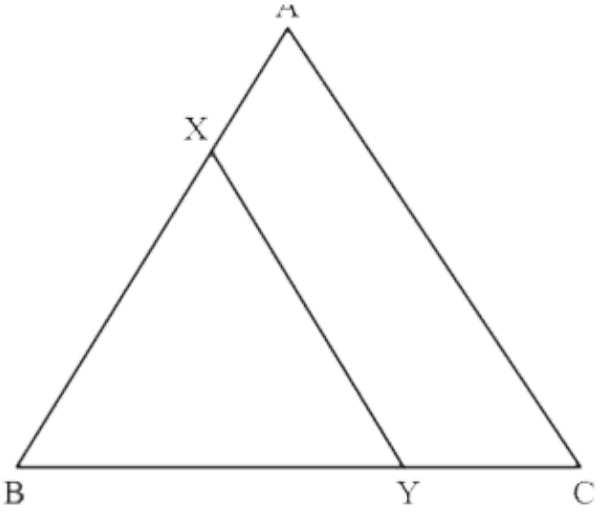
21. In the given figure, the line segment XY is Parallel to AC of ΔABC and it divides the triangle into two parts of equal areas. Prove that

$$\frac{AX}{AB} = \frac{\sqrt{2}-1}{\sqrt{2}}$$



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22. Through the vertex D of a parallelogram ABCD, a line is drawn to intersect the sides BA and BC produced at E and F respectively. Prove that $\frac{DA}{AE} = \frac{FB}{BE} = \frac{FC}{CD}$

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23. Theorem 6.9 : In a triangle, if square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle.

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24. Prove that is a right angle triangle, the square of the hypotenuse is equal the sum of the squares of other two sides.

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25. Theorem 6.1 : If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

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