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Sahi Prep Hai Toh Life Set Hai

TRIANGLE-2

Area of Δ $\rightarrow$ (35–40) min

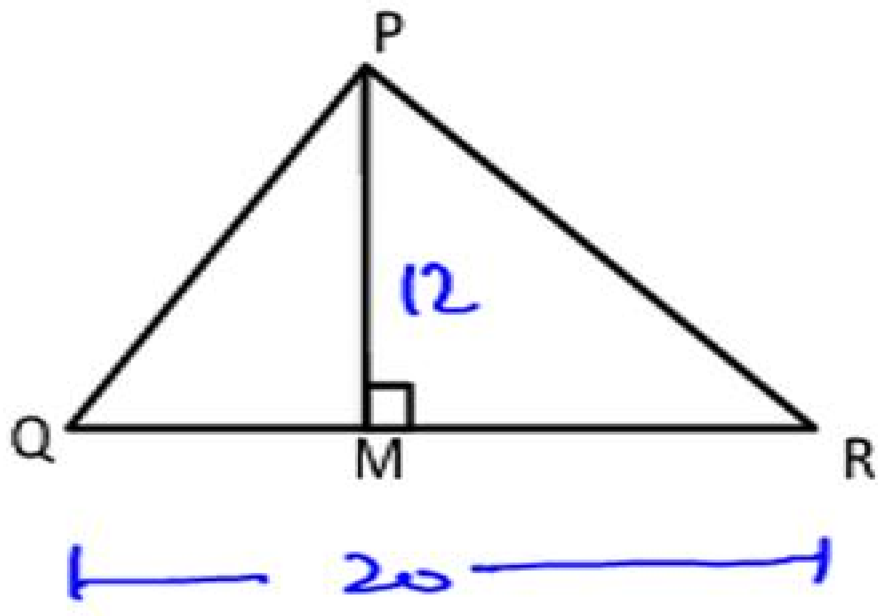
Isosceles, Equilateral & Right angled Δ $\rightarrow$ (5–10) min

Similarity $\rightarrow$ (45–55) min

AREAS OF TRIANGLE

(1) $$Area = \frac{1}{2} \times Base \times Height$$

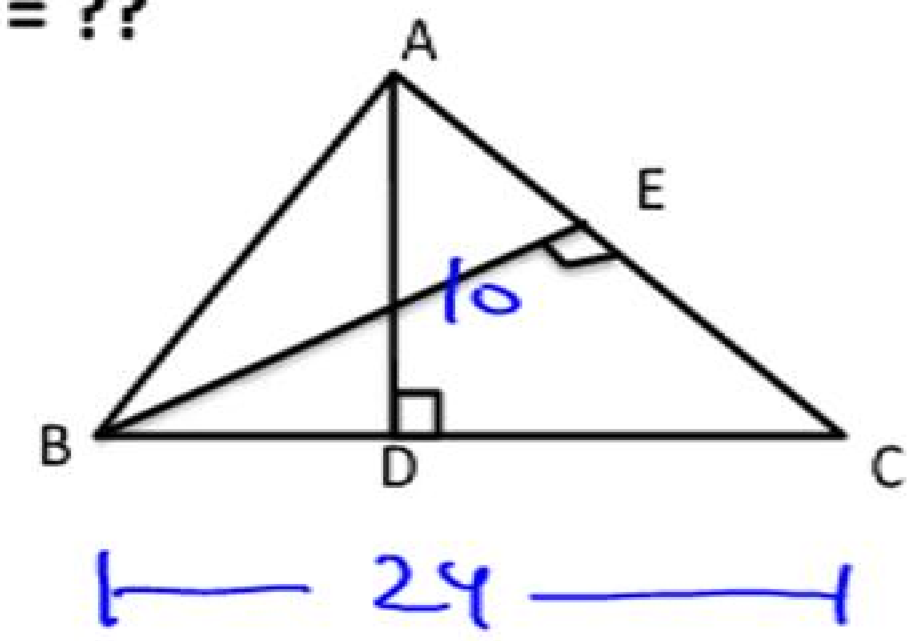
Eg1. If QR = 20 cm
PM = 12 cm
Find area of triangle.



$$\frac{1}{\cancel{2}} \times \overset{10}{\cancel{20}} \times 12$$

$$= \underline{120 \text{ cm}^2}$$

Q1. If AD = 10 cm, BC = 24 cm, AC = 20 cm, BE = ??



$$\overset{12}{\cancel{24}} \cdot \cancel{10} = \cancel{20} \cdot BE$$

$$BE = 12\,cm$$

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Q2. Area of 2 triangles are in the ratio 16 : 25 and their altitudes are in the ratio 5 : 4. Find the ratio of their corresponding base?

$$\frac{\cancel{\frac{1}{2}} B_1 \cancel{H_1}\,5}{\cancel{\frac{1}{2}} B_2 \cancel{H_2}\,4} = \frac{16}{25}$$

$$\frac{B_1}{B_2} = \frac{64}{125}$$

Hero'n

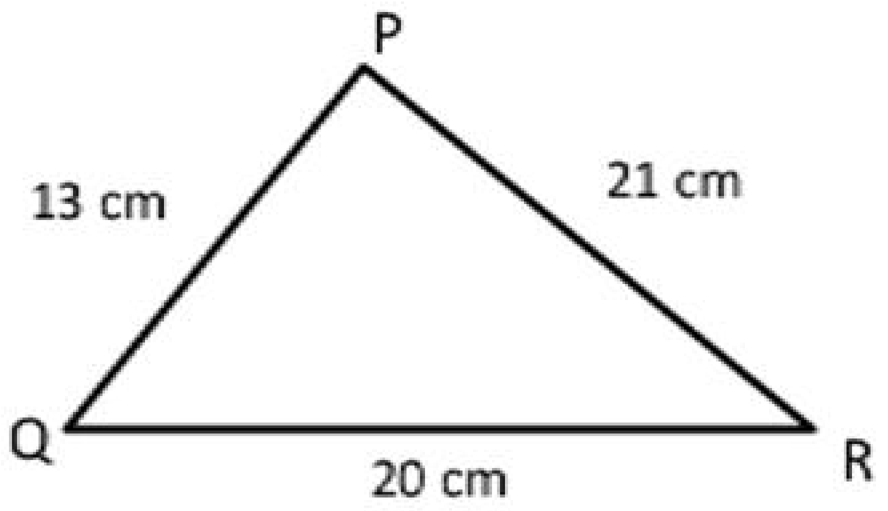
(2) Area of $\Delta = \sqrt{s(s-a)(s-b)(s-c)}$

$s \rightarrow semi-perimeter$

$s = \dfrac{a+b+c}{2}$

$a, b \,\&\, c$ are sides of Δ.

Eg2. Find the area of given triangle.



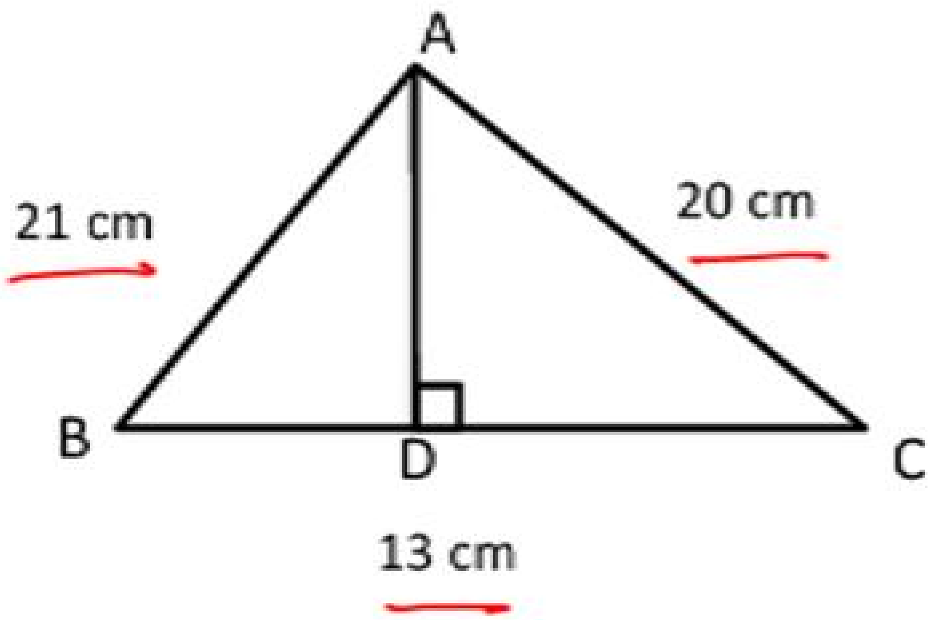
$S = \dfrac{13+20+21}{2} = 27$

Area $= \sqrt{27(27-13)(27-20)(27-21)}$

$= \sqrt{27 \cdot 14 \cdot 7 \cdot 6}$

$= 7 \cdot 2 \cdot 9 \Rightarrow 126 \text{ cm}^2$

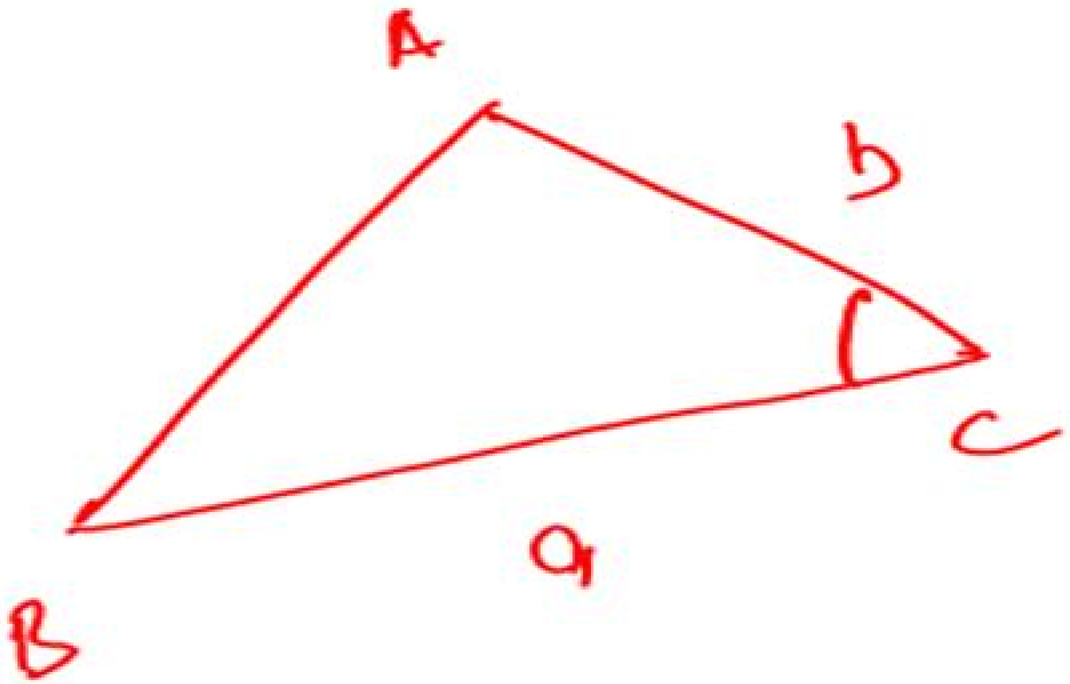
Q3. Find AD = ??



$126 = \frac{1}{2} \cdot 13 \cdot H$

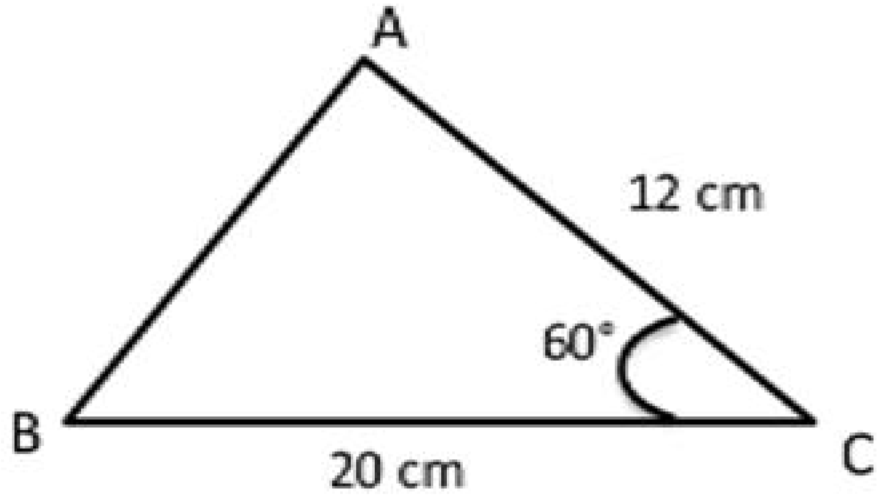
$\frac{252}{13} = AD$

(3) $$\text{Area of } \Delta = \frac{1}{2}ab\sin C$$



$$\frac{1}{2}a\cdot b\sin C$$

Eg3. Find area of triangle.

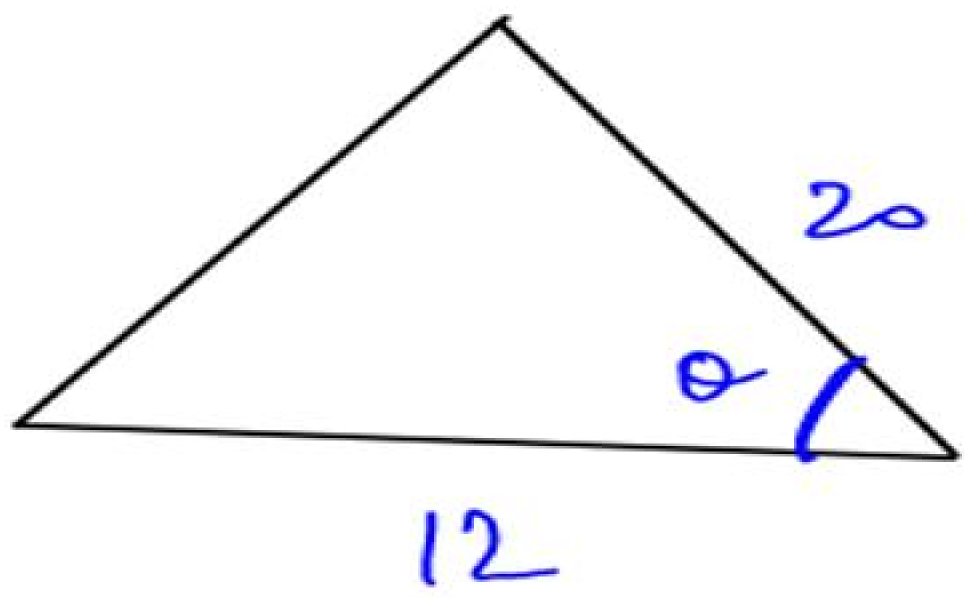


$$\frac{1}{\cancel{2}}\cdot\overset{10}{\cancel{20}}\cdot 12\sin 60$$

$$\overset{60}{\cancel{120}}\cdot\frac{\sqrt{3}}{\cancel{2}}$$

$$60\sqrt{3}\ cm^2$$

Q4. If 2 sides of a triangle are 12 cm and 20 cm, what can be the maximum area of triangle?



$$\frac{1}{\cancel{2}} \cdot \overset{6}{\cancel{12}} \cdot 20 \cdot \sin\theta$$

Max value of $\sin\theta$

$= 1$

120

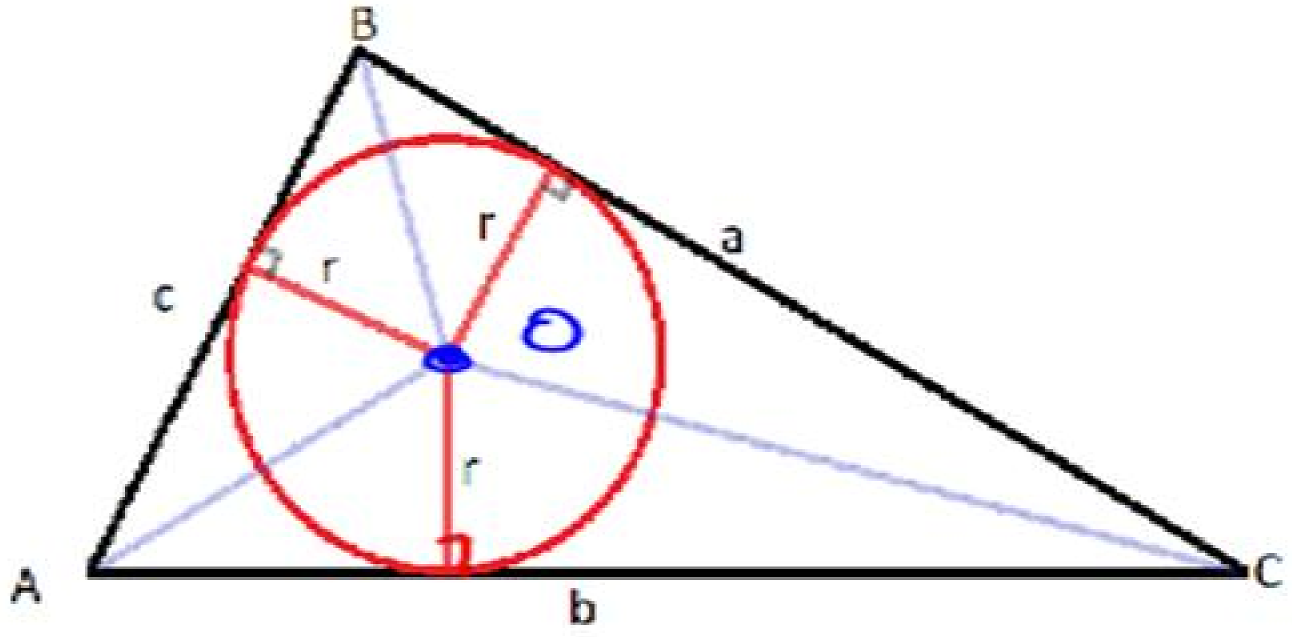
If 2 sides of Δ are given then maximum area is always of a Right Angled Triangle.

If a, b are 2 sides of a Δ :

$$Max\ Area = \frac{1}{2}ab$$

(4) $\boxed{\textbf{Area} = \mathbf{r} \cdot \mathbf{s}}$

where :
r - inradius
s - semi-perimeter



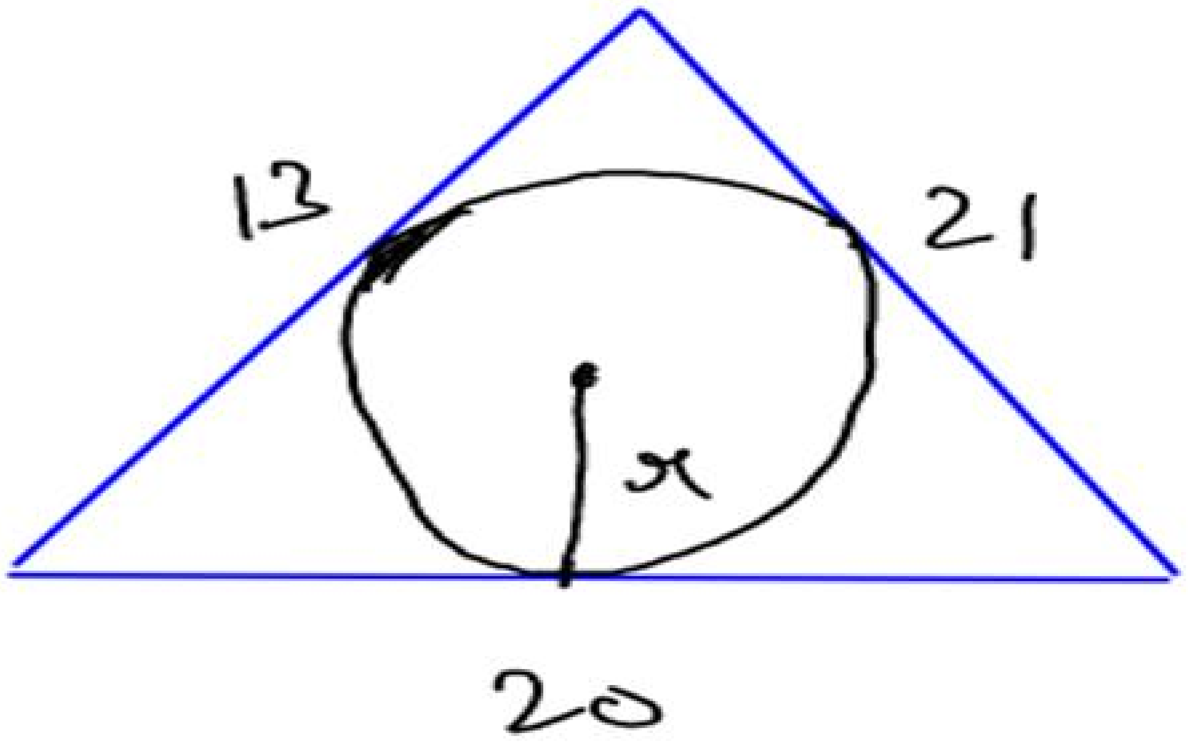
Area of $\Delta ABC \Rightarrow$ Area of $(\Delta AOC + \Delta BOC + \Delta AOB)$

$= \frac{1}{2} AC \cdot r + \frac{1}{2} BC \cdot r + \frac{1}{2} AB \cdot r$

$= \underline{\frac{1}{2}(AC + BC + AB)} \cdot r$

$S \cdot r$

Q5. Find the in-radius of triangle whose sides are 13 cm, 21 cm and 20 cm.



$$\text{Area} = r \cdot s$$

$$126 = r \cdot 27$$

$$r = \frac{\cancel{126}^{14}}{\cancel{27}_{3}}$$

$\boxed{r \cdot s = \text{Area}}$

$\boxed{r = \dfrac{Area}{s}}$

V. imp

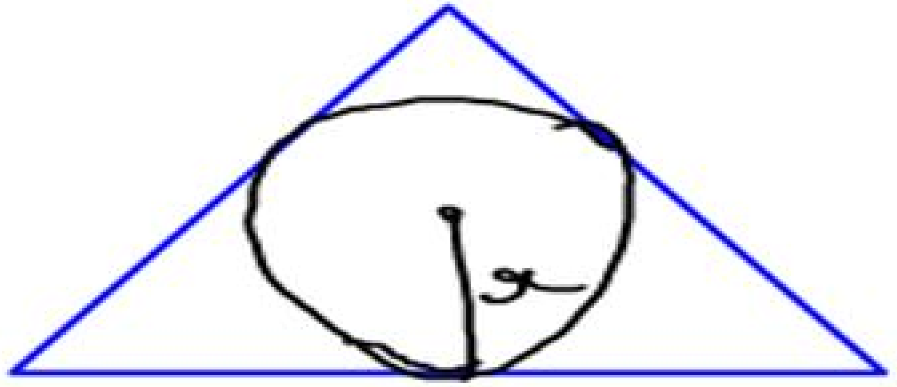
Inradius (r)

For any △ $= \dfrac{Area}{s}$

Equilateral △ $= \dfrac{Side}{2\sqrt{3}}$

Right angle △ $= \dfrac{Base + Perpendicular - Hypotenuse}{2}$

eg



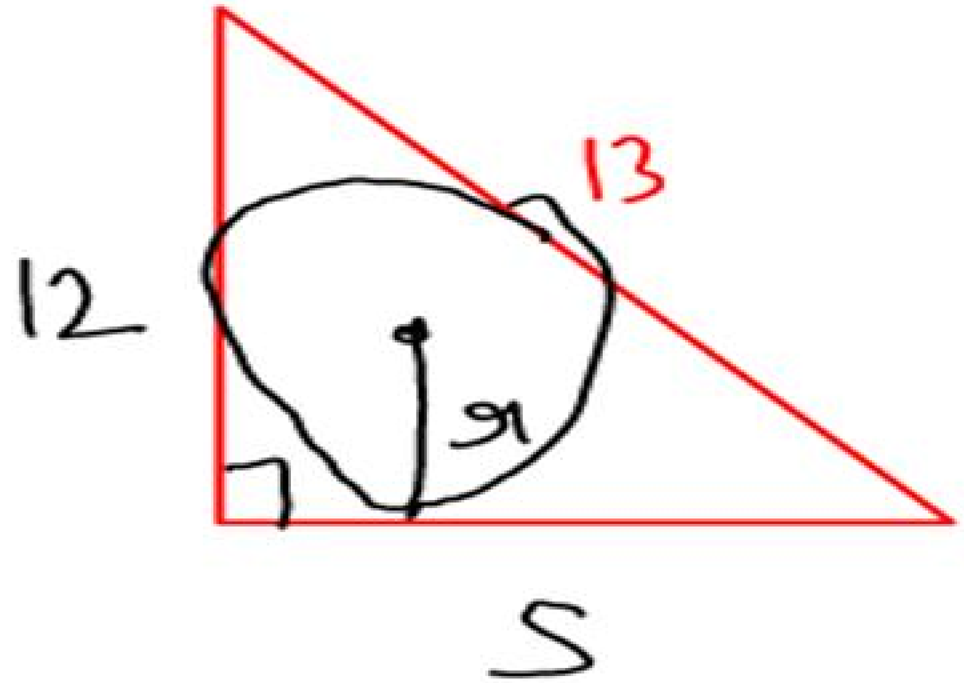
Equilateral Δ

$s = 10\sqrt{3}$

$r = \dfrac{\text{side}}{2\sqrt{3}} = \dfrac{\cancel{10}\sqrt{3}}{\cancel{2\sqrt{3}}}$

5

eg

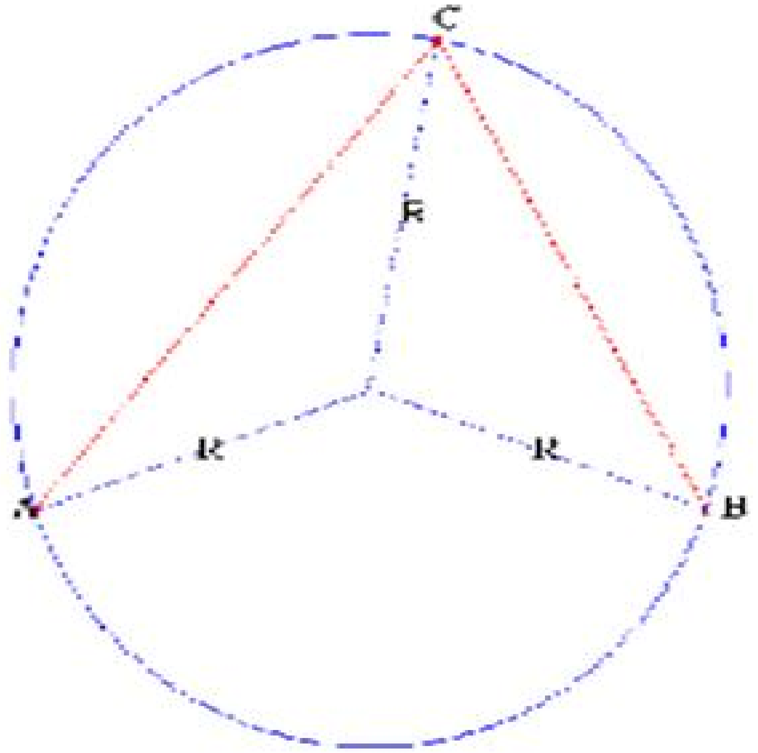


$r = ??$

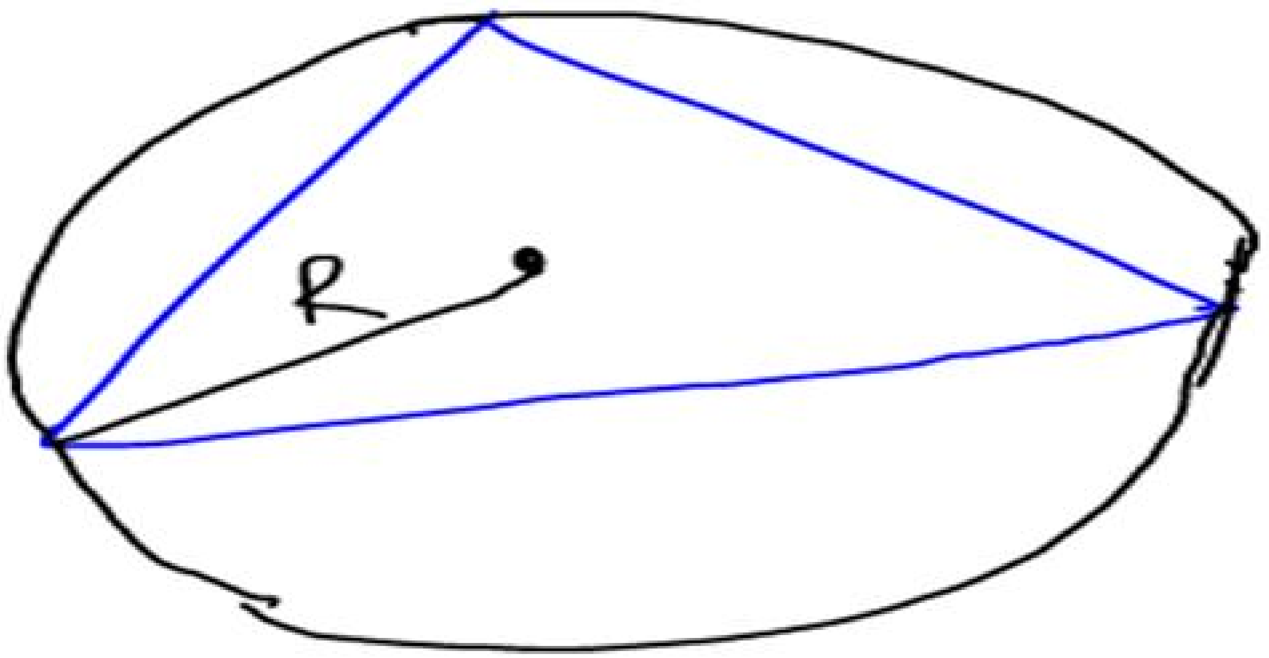
$\dfrac{b+p-h}{2}$

$\dfrac{5+12-13}{2} = 2$

CIRCUMRADIUS



The circumradius is the radius of the circumscribed circle of that polygon.



(5) $$Area\ of\ \Delta = \frac{a \cdot b \cdot c}{4R}$$

where, a, b, c are sides of triangle.

R → Circum-radius

Eg4. Find the circum-radius of triangle whose sides are 13 cm, 21 cm and 20 cm.

$$\overset{6}{\cancel{126}} = \frac{13 \cdot \cancel{21} \cdot 20}{4R}$$

$$R = \frac{13 \cdot \cancel{20}\,5}{\cancel{4} \cdot 6}$$

$$\frac{65}{6}$$

$$Area\ of\ \Delta = \frac{a \cdot b \cdot c}{4R}$$

$$R = \frac{a \cdot b \cdot c}{4 \cdot Area\ of\ \Delta}$$

Circumradius (R)

v.imp

For any ∆ $= \dfrac{a \cdot b \cdot c}{4 \cdot Area\ of\ \Delta}$

Equilateral ∆ $= \dfrac{Side}{\sqrt{3}}$

Right angle ∆ $= \dfrac{Hypotenuse}{2}$

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AREA OF TRIANGLE (For any Δ)

(1) $Area = \frac{1}{2} \times Base \times Height$

(2) $Area\ of\ \Delta = \sqrt{s(s-a)(s-b)(s-c)}$

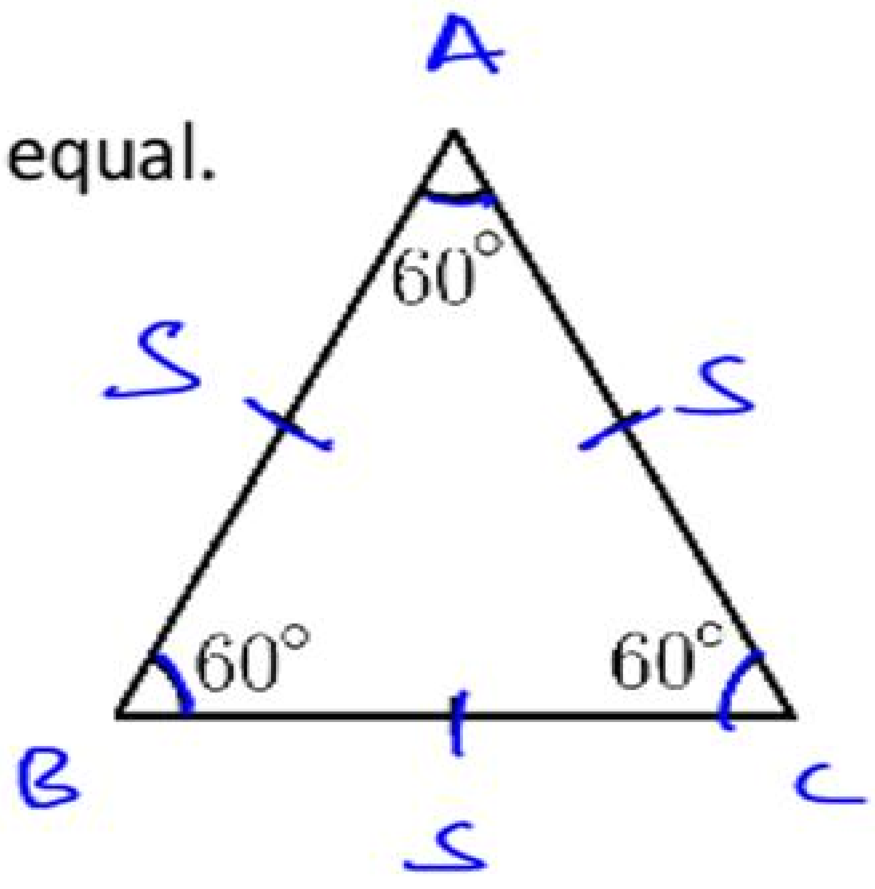
(3) $Area\ of\ \Delta = \frac{1}{2} ab \sin C$

(4) $Area\ of\ \Delta = r \cdot s$

(5) $Area\ of\ \Delta = \frac{a \cdot b \cdot c}{4R}$

EQUILATERAL TRIANGLE

An **equilateral triangle** is a **triangle** in which all three sides are equal.



$$Height\ of\ equilateral\ \Delta = \frac{\sqrt{3}}{2} \times S$$

$$Area\ of\ equilateral\ \Delta = \frac{\sqrt{3}}{4} \times S^2$$

Eg. If height of equilateral triangle = 12 cm.
Find area of equilateral triangle.

Sol^{n}

$$\frac{\sqrt{3}}{2} s = \cancel{12}\, 4\sqrt{3}$$

$$s = 8\sqrt{3}$$

$$\frac{\sqrt{3}}{\cancel{4}} \cdot \cancel{8}^{2}\sqrt{3} \cdot 8\sqrt{3}$$

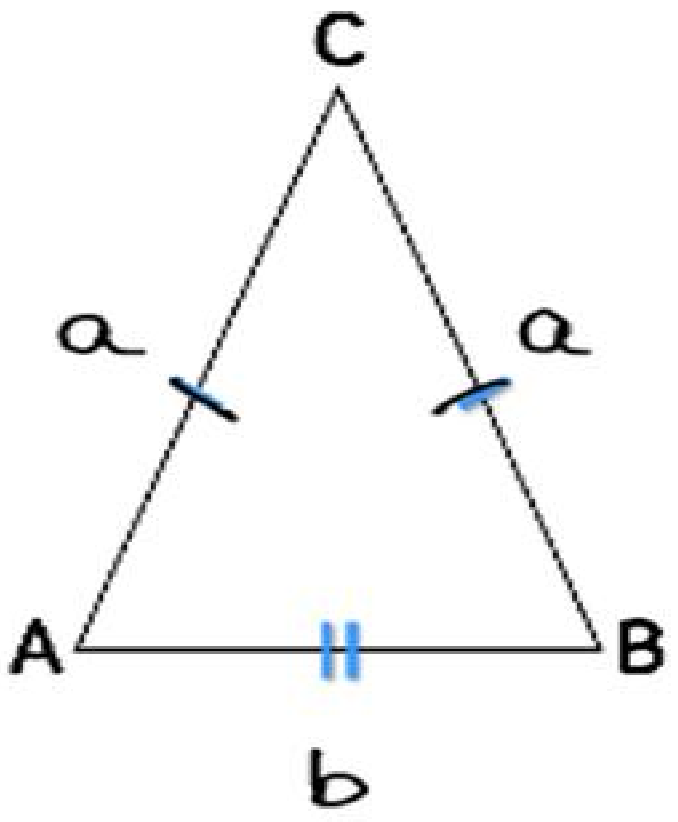
$$\underline{\underline{48\sqrt{3}\ cm^2}}$$

ISOSCELES TRIANGLE

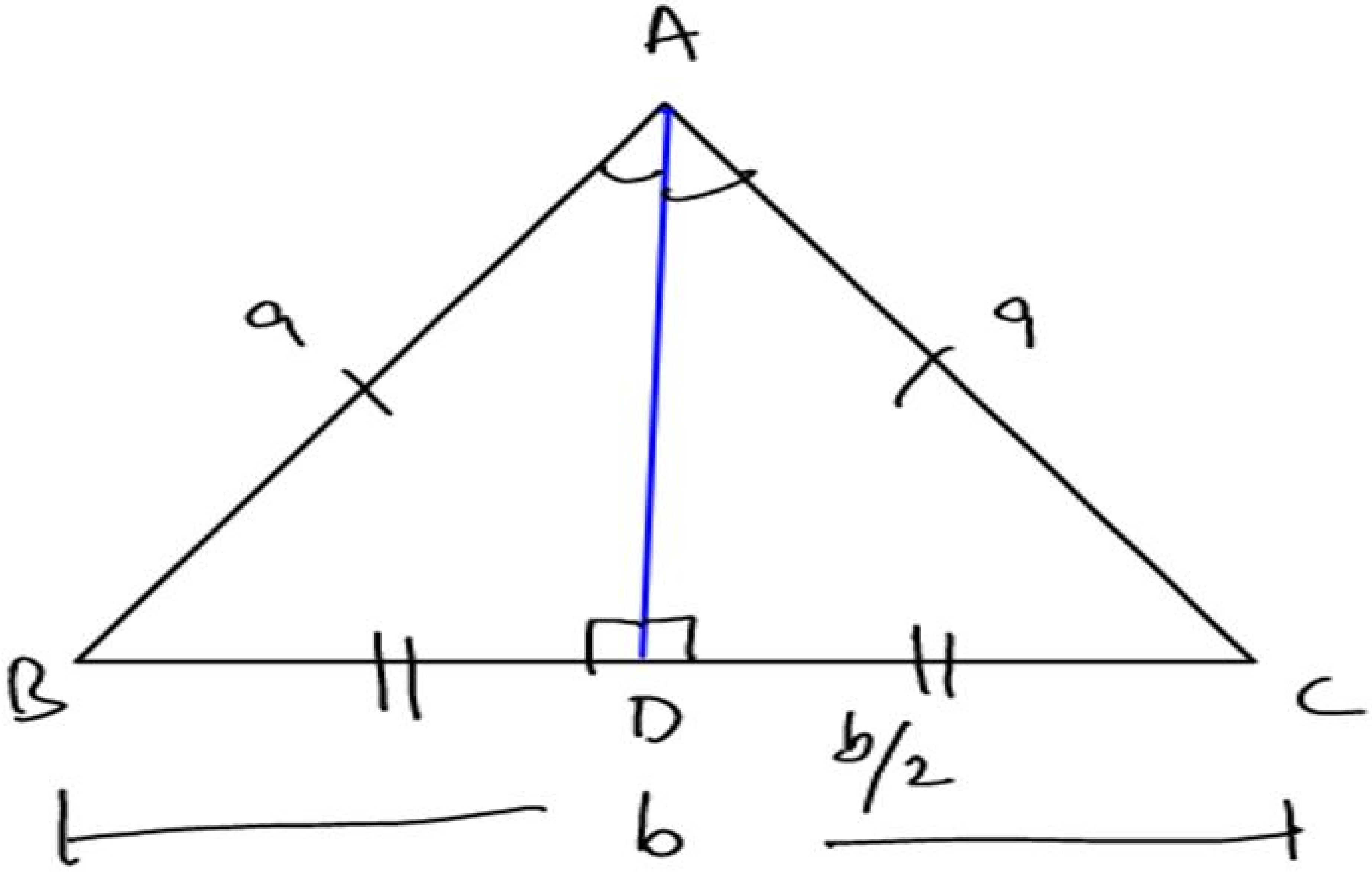
An **isosceles triangle** is a **triangle** that has two sides of equal length.

$$Area\ of\ isosceles\ \Delta = \frac{b}{4}\sqrt{4a^2 - b^2}$$

Where, b is base of isosceles Δ.
and a is length of equal sides.



Area of Isosceles $\Delta = \frac{1}{4} b\sqrt{4a^2 - b^2}$



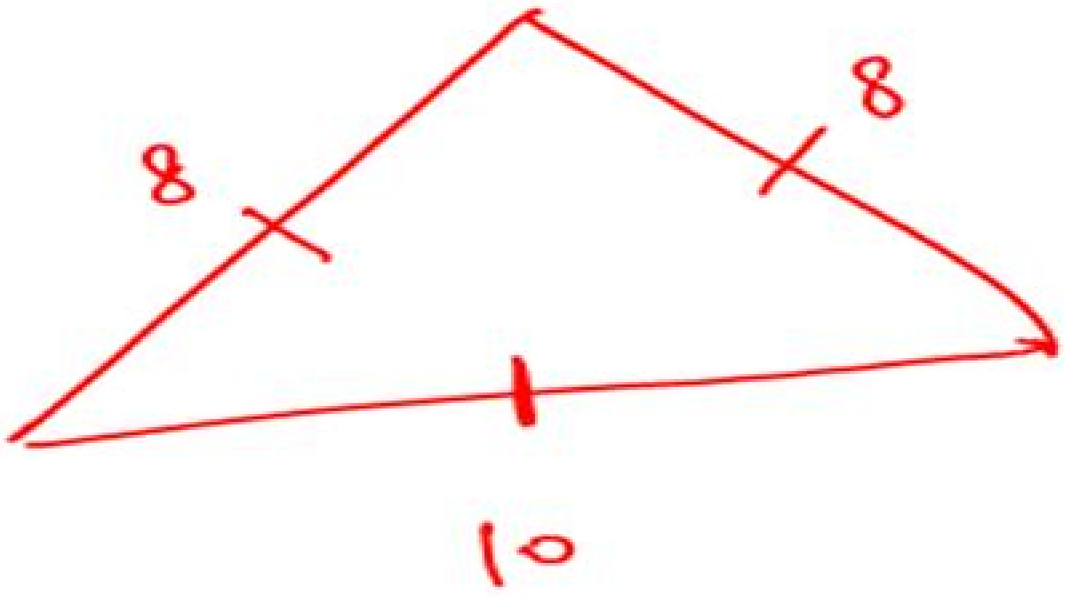
$$(AD)^2 + \left(\frac{b}{2}\right)^2 = a^2$$

$$AD = \sqrt{a^2 - \frac{b^2}{4}}$$

$$\frac{1}{2} \times b \times \sqrt{\frac{4a^2 - b^2}{2}}$$

eg

Find area of Isosceles Δ



$$\frac{1}{4}\, b \cdot \sqrt{4a^2 - b^2}$$

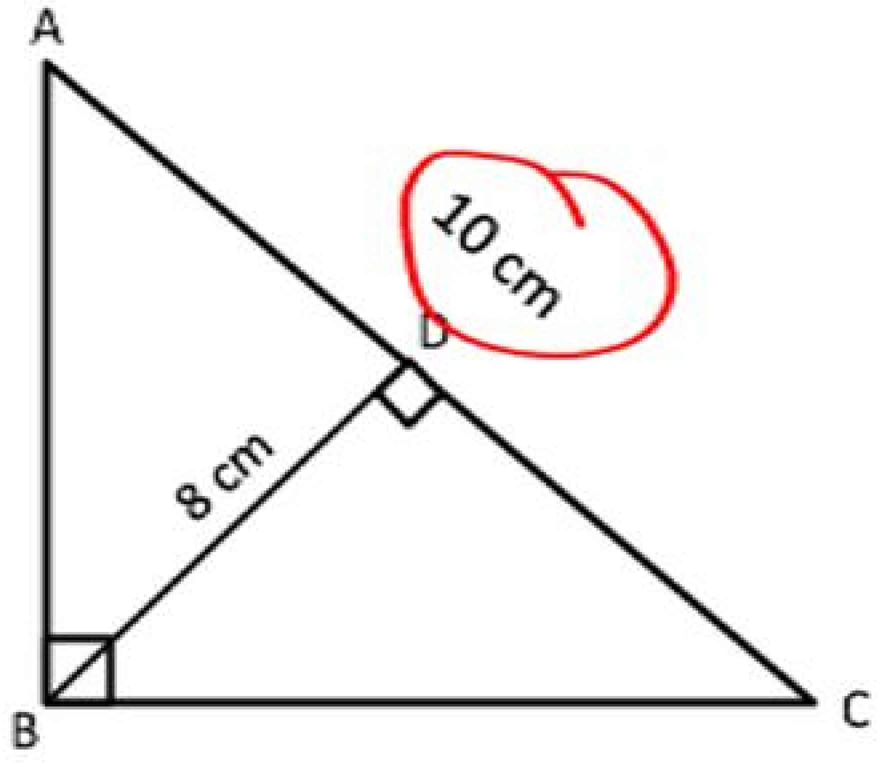
$$\frac{1}{4} \cdot 10 \sqrt{4 \cdot 8^2 - 10^2}$$

$$\frac{1}{4} \cdot 10 \sqrt{156}$$

$$\frac{1}{\cancel{4}} \cdot \cancel{10}^{5} \cdot \cancel{2}\sqrt{39}$$

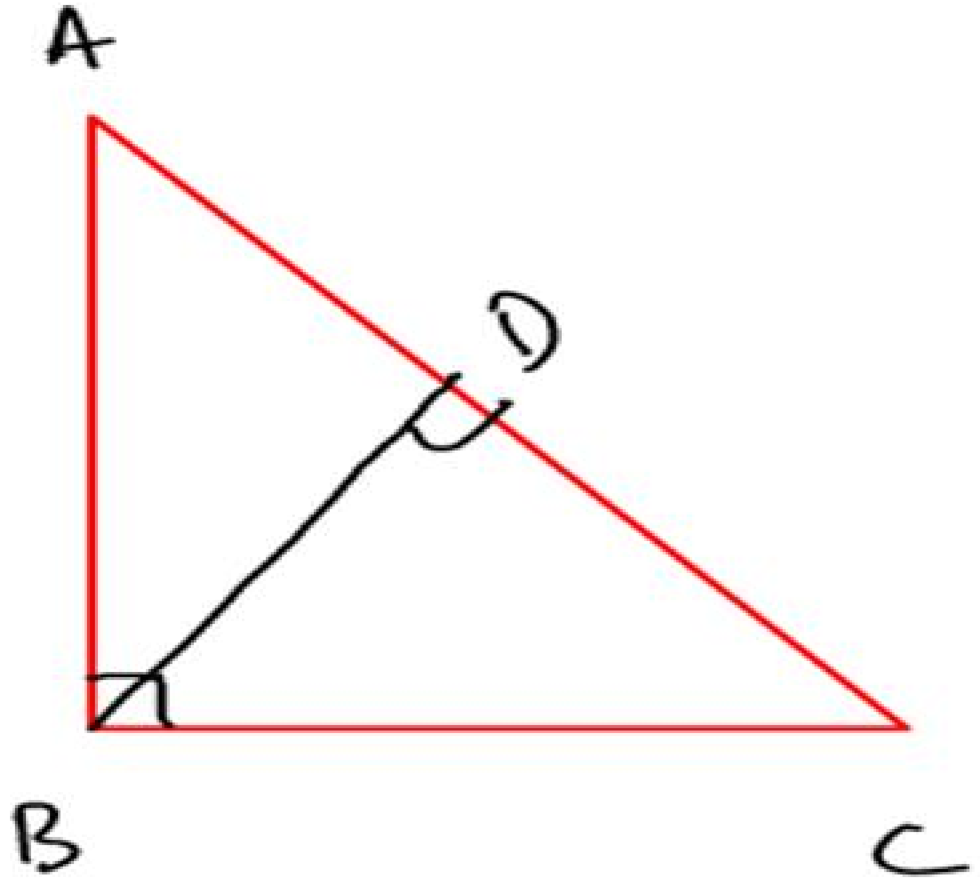
$$5\sqrt{39}\ cm^2$$

Eg. In a ΔABC, AC = 10 cm ; BD = 8 cm
Find area of ΔABC.



Data is wrong

B/c Max value of BD is 5.



Note

Height drawn on hypotenuse is always less than or equal to half of the hypotenuse

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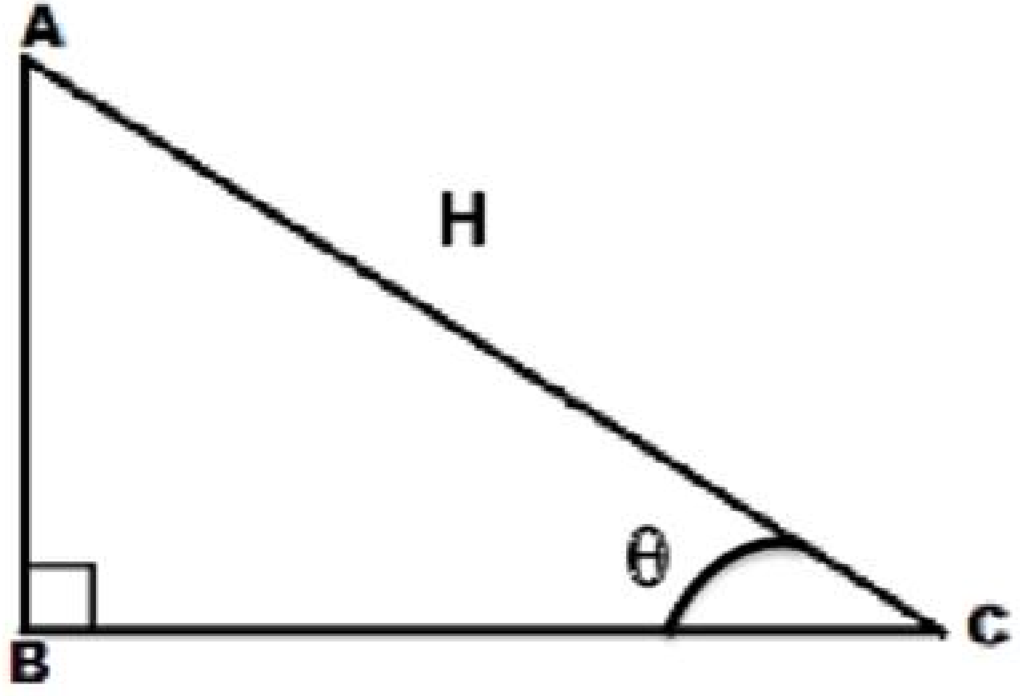
RIGHT ANGLE TRIANGLE

imp

$$\text{Area of right angle } \Delta = \frac{H^2}{4}\sin 2\theta$$



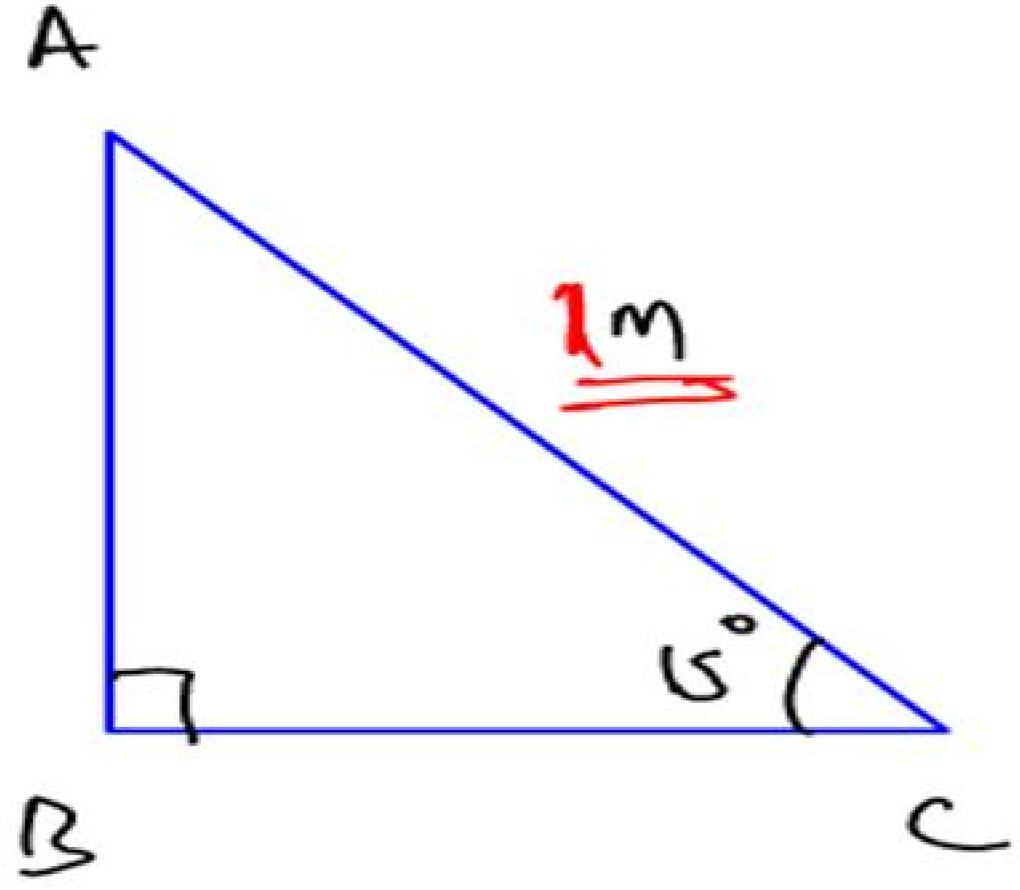
Where, H → Hypotenuse
and, θ → one of the acute angle of right angle triangle.

$\sin\theta = \frac{AB}{H}$ $\qquad$ $\text{Area} = \frac{1}{2} BC \cdot AB$

$AB = H\sin\theta$ $\qquad$ $\frac{1}{2}(H\cos\theta)(H\sin\theta)$

$BC = H\cos\theta$ $\qquad$ $\frac{1}{2 \cdot 2}\underline{(2\sin\theta\cos\theta)}H^2$

eg

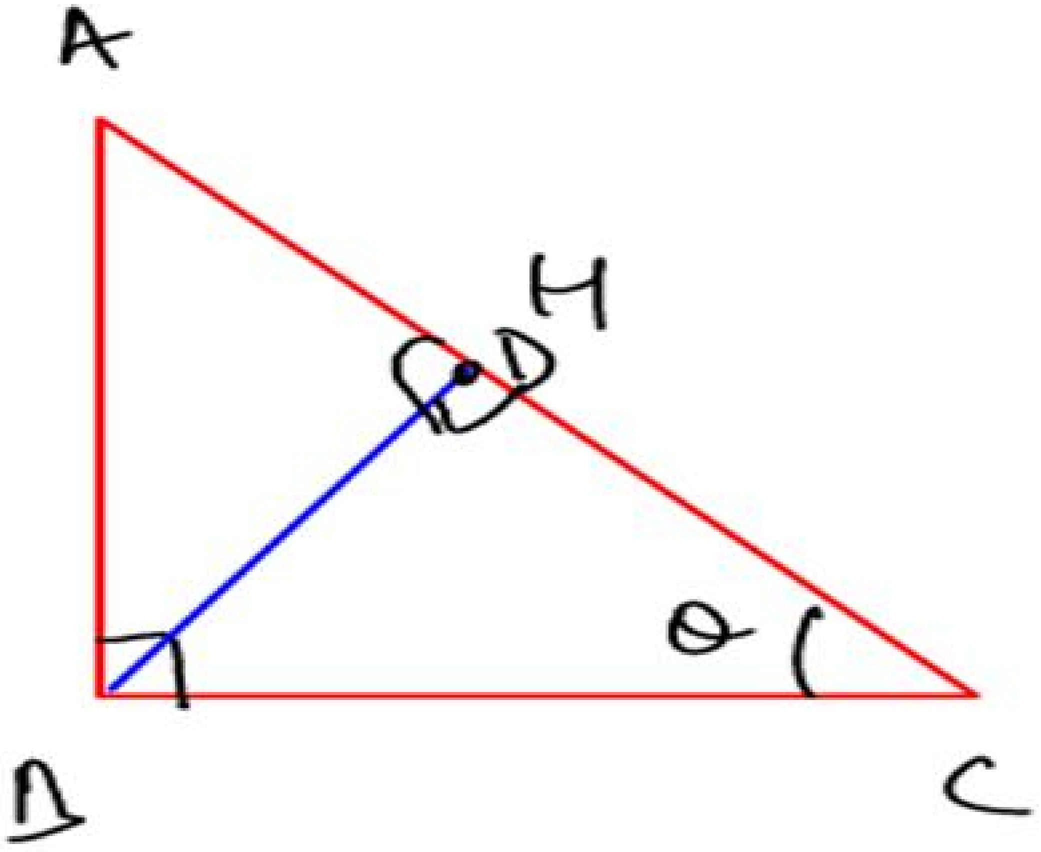


Find Area of $\triangle ABC$ in $\underline{\underline{cm^2}}$??

$$\text{Area} = \frac{H^2}{4}\sin 2\theta$$

$$\frac{(100)^2}{4}\cdot \sin 30 = \frac{(100)^2}{4}\cdot\frac{1}{2}$$

$$\boxed{1250\ cm^2}$$



$$\text{Area} = \frac{H^2}{4}\overset{1}{\sin 2\theta}$$

$$\text{Area} = \frac{1}{2} H \cdot BD$$

$$\max\left(\frac{1}{2} H \cdot BD\right) = \frac{H^2}{4}\cancel{\overset{1}{\sin 2\theta}}$$

$$\frac{1}{\cancel{2}} \cdot \cancel{H} \cdot (BD)_{max} = \frac{\cancel{H} \cdot H}{\cancel{4}\, 2}$$

Eg. If hypotenuse of a right angle Δ is 10 cm. What can be its maximum area?

$$\text{Area} = \frac{H^2}{4}(\sin 2\theta)$$

$$(\text{Area})_{max} = \frac{H^2}{4}$$

$$= \frac{(10)^2}{4} = 25\,cm^2$$

SIMILARITY

Similarity means 'similar in terms of shape' & 'proportion in terms of size'.

Two squares are similar, when ?? Always

Two circles are similar, when ?? Always

Two line segments are similar, when ?? Always

Two polygons are similar, if

(i) their corresponding angles are equal.

(ii) the ratio of their corresponding sides are same.

Δ is a special polygon, even if, one of the condition exist then also triangles are similar.

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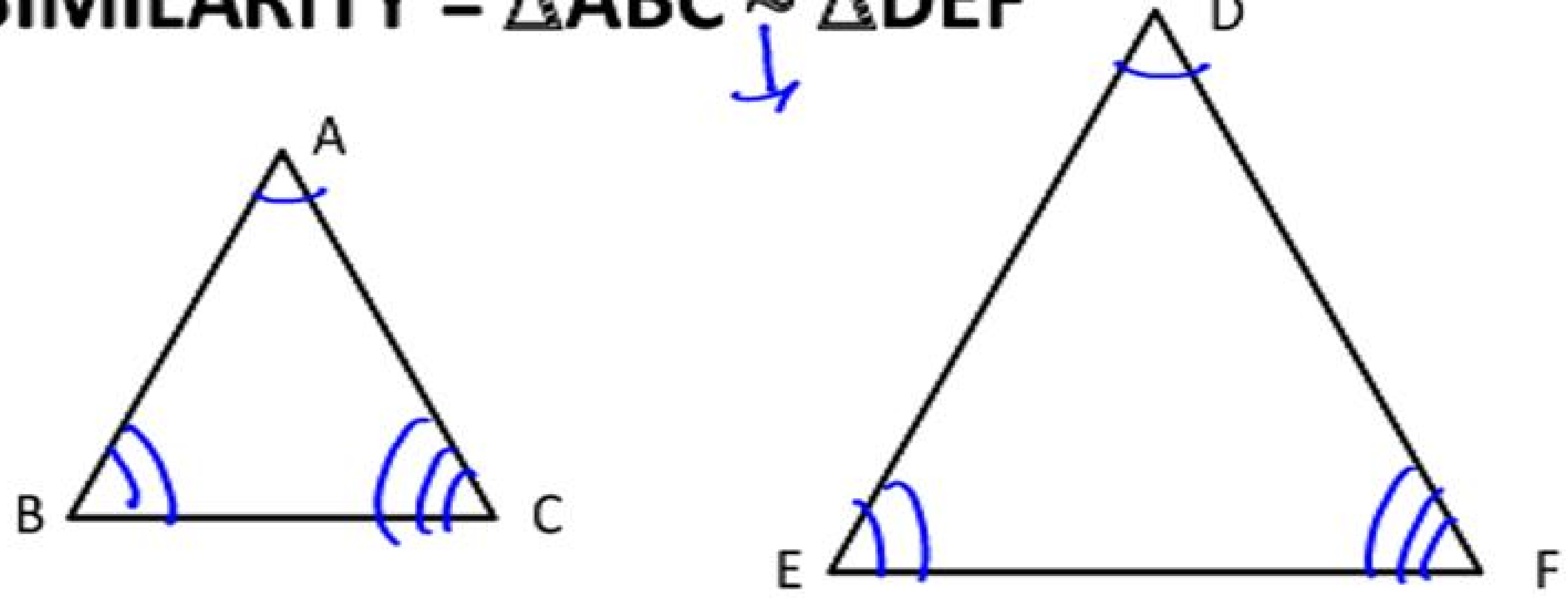
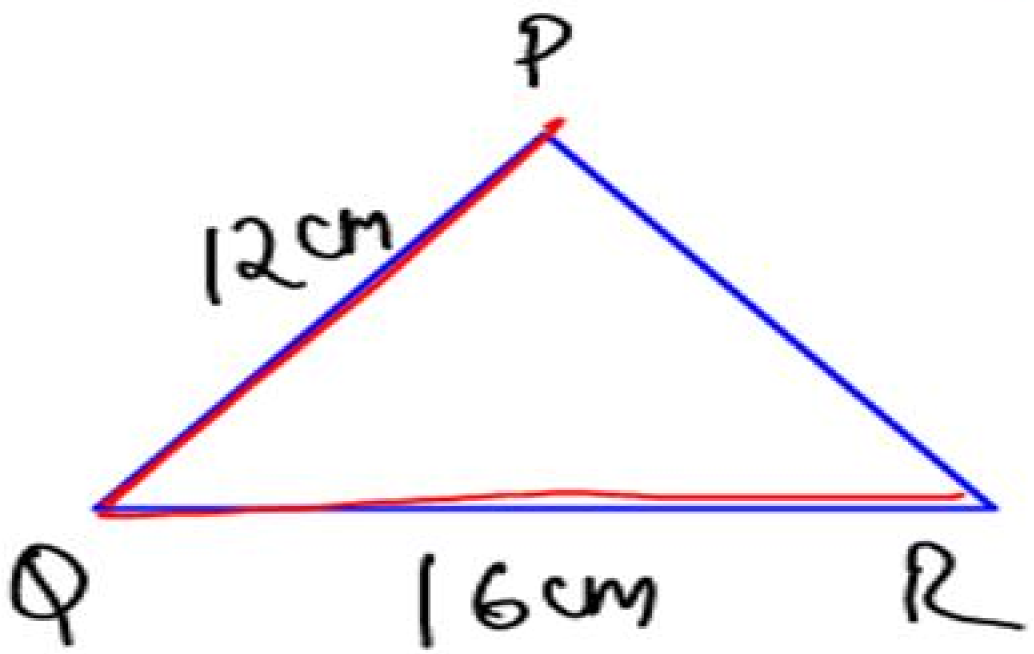
SYMBOL OF SIMILARITY = $\Delta ABC \sim \Delta DEF$

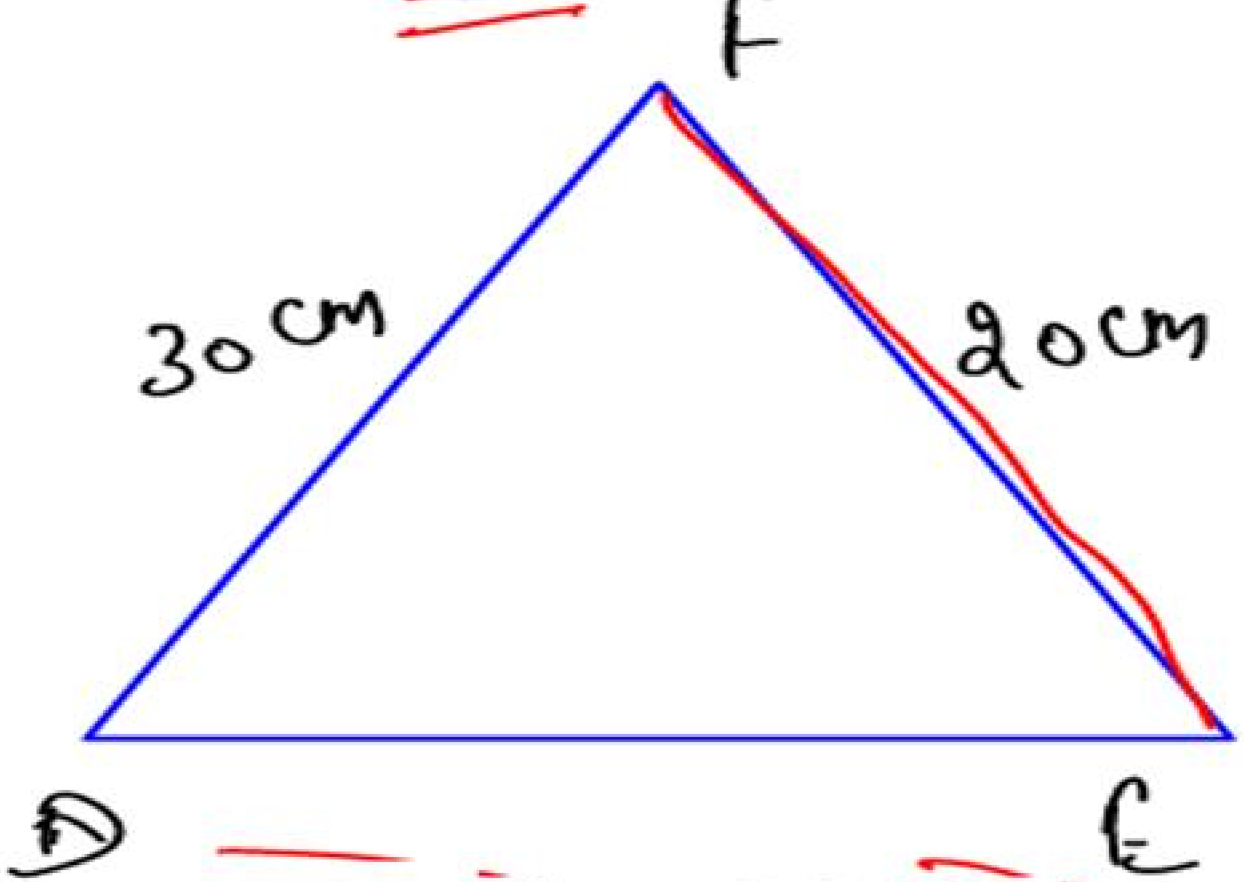
(i) $\angle A = \angle D$, $\angle B = \angle E$, $\angle C = \angle F$

(ii) $\dfrac{AB}{DE} = \dfrac{BC}{EF} = \dfrac{AC}{DF} = K$



eg $\triangle PQR \sim \triangle DEF$





find PR & DE

$$\boxed{\frac{12}{DE} = \frac{16}{20} = \frac{PR}{30}}$$

$DE = 15 \quad PR = 24$

Eg. $\overline{\Delta ABC} \sim \overline{\Delta PQR}$

If AB = 20 cm, BC = 12 cm, PQ = 8 cm

Find QR = ??

$$\frac{20}{8} = \frac{12}{QR}$$

$$QR = \frac{96}{20} \Rightarrow \underline{\underline{4.8}} \text{ cm}$$

If two triangles are similar, then the ratio of their corresponding sides is equal and let the ratio be K

then, ratio of perimeter = K

altitudes = K

medians = K

length of angle bisector = K

inradius = K

circumradius = K

Ratio of Areas = K^2

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Eg. $\Delta ABC \sim \Delta DEF$

If BC = 3 cm, EF = 4 cm, Area of $\Delta DEF = 96\ cm^2$

Find area of ΔABC.

$$\frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta DEF} = \frac{9}{16} =$$

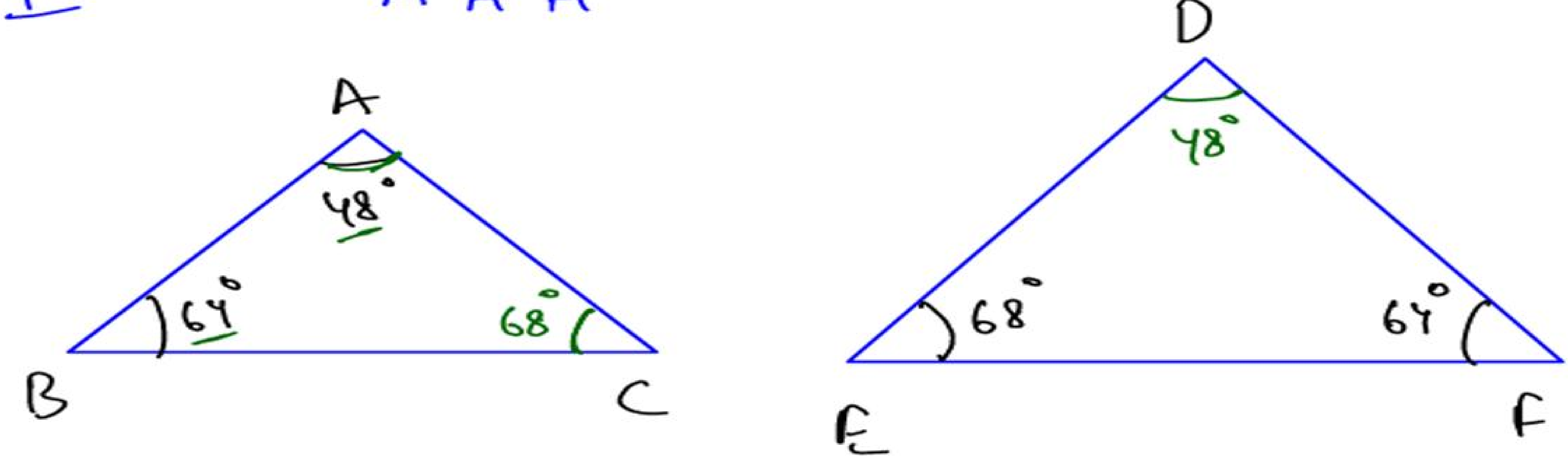
$$\frac{\text{Area of } \Delta ABC}{\cancel{96}\ 6} = \frac{9}{\cancel{16}}$$

$$\text{Area of } \Delta ABC = 54\ cm^2$$

CONDITIONS OF SIMILARITY

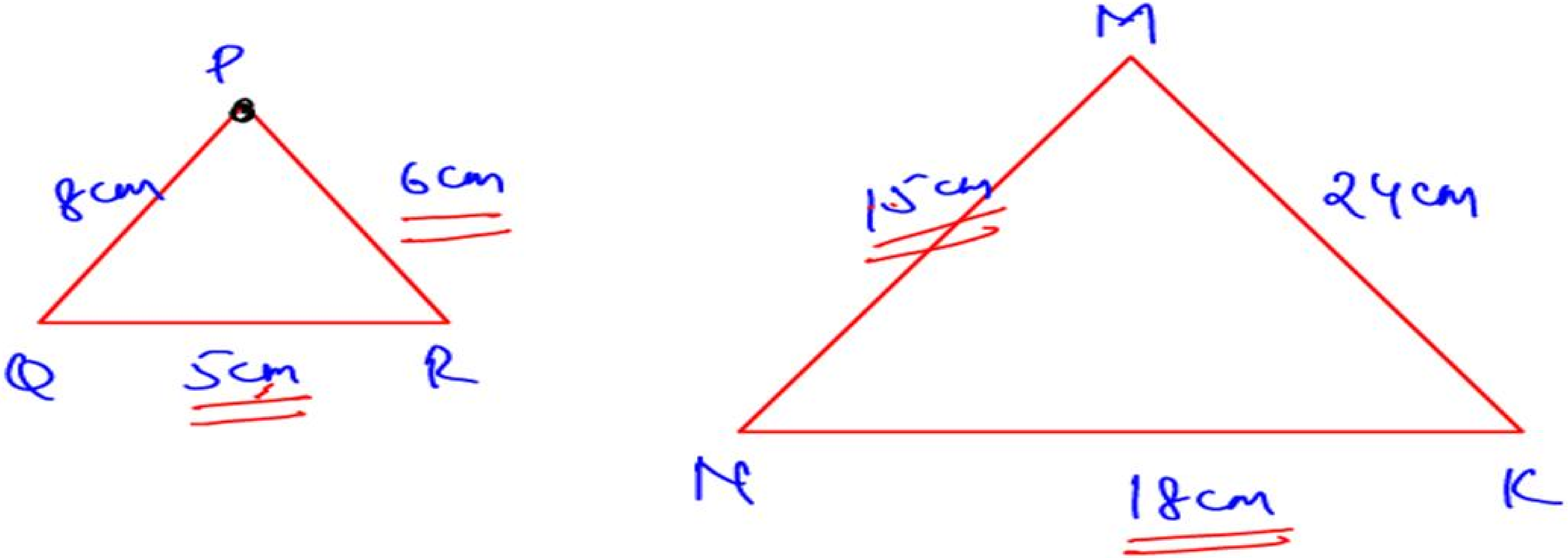
(1) AAA or AA	(Angle – Angle)
(2) SSS	(Side – Side – Side)
(3) SAS	(Side – Angle – Side)

I AAA



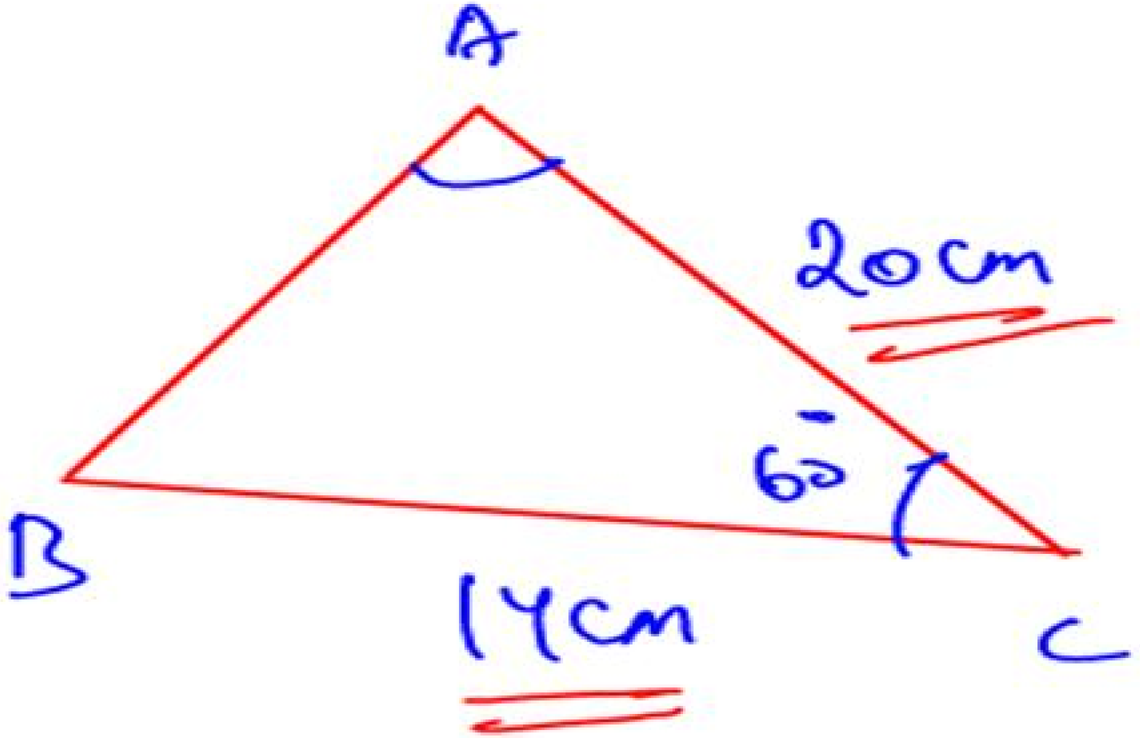
$\boxed{\Delta ABC \sim \Delta DEF}$

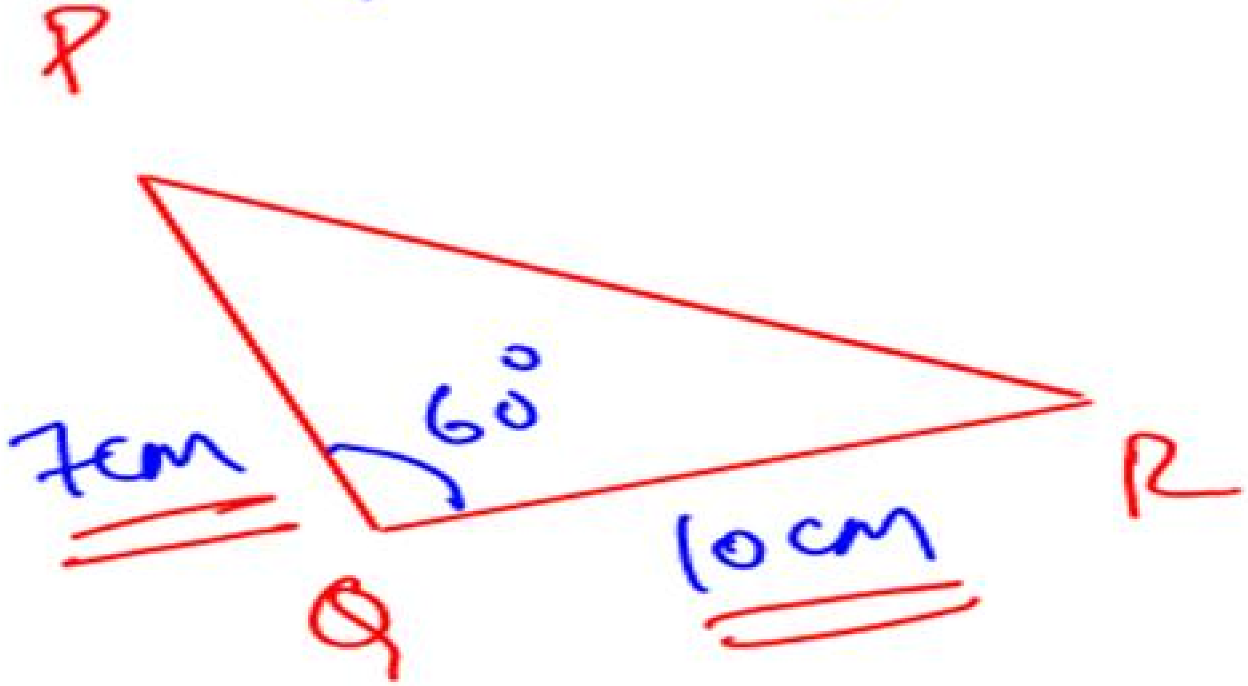
II SSS (side-side-side)



$\boxed{\Delta PQR \sim \Delta KMN}$

III SAS (Side - Angle - Side)

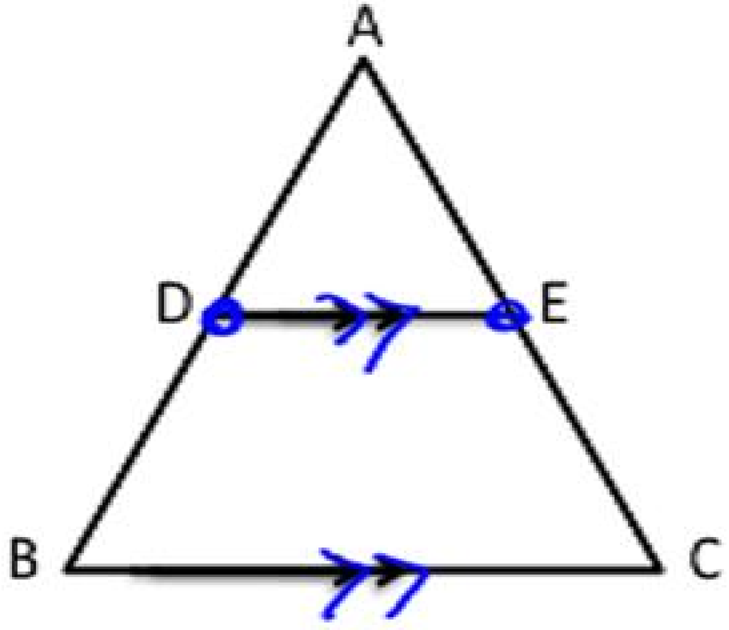




$\triangle ABC \sim \triangle RPQ$

BASIC PROPORTIONALITY THEOREM OR THALES THEOREM

V. Imp

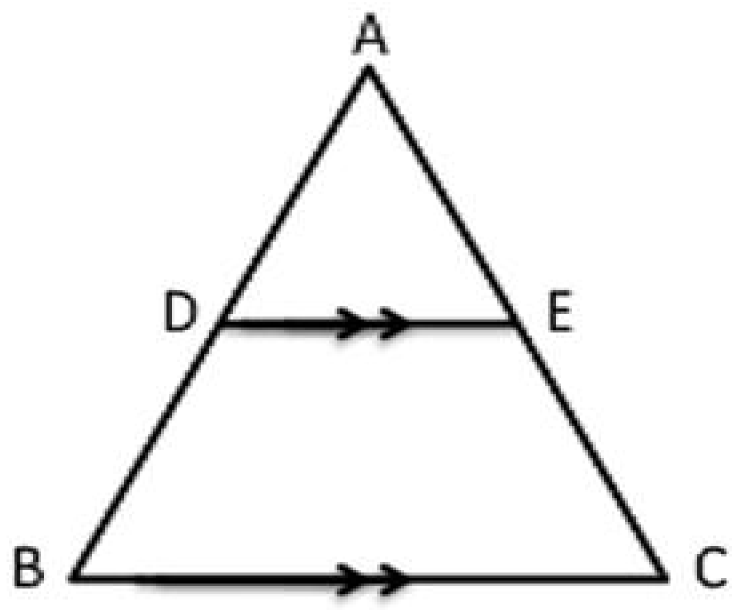


If a line is drawn parallel to one side of a triangle intersecting the other two sides then it divides the two sides in the same ratio.

Given : D, E are points on AB and AC such that DE ||BC

$$\boxed{\frac{AD}{DB} = \frac{AE}{EC}}$$

Proof of BPT or Thales:



Given : D, E are points on AB and AC such that DE | |BC

To prove: $$\frac{AD}{DB} = \frac{AE}{EC}$$

Proof : In ΔADE & ΔABC

$\angle A = \angle A$ (Common)

$\angle ADE = \angle ABC$ (Corresponding angle)

$\therefore$ $\Delta ADE \sim \Delta ABC$

$$\frac{AD}{AB} = \frac{AE}{AC}$$

$$\frac{AB}{AD} - 1 = \frac{AC}{AE} - 1$$

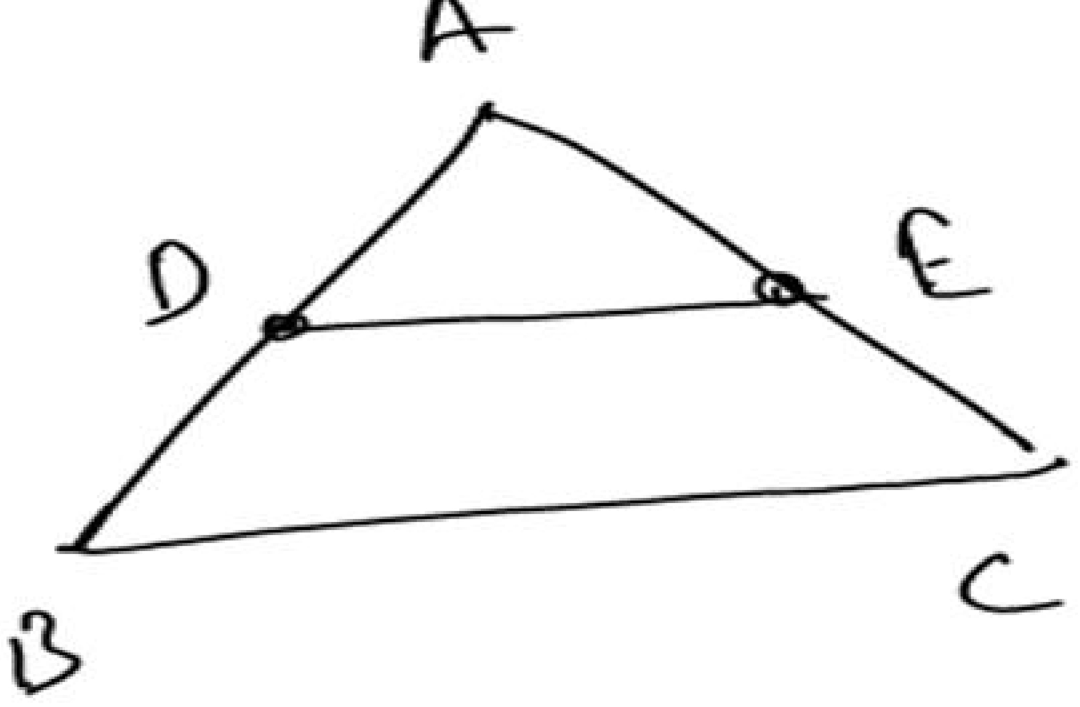
$$\frac{DB}{AD} = \frac{EC}{AE}$$

$$\frac{AD}{DB} = \frac{AE}{EC}$$

CONVERSE OF BASIC PROPORTIONALITY THEOREM

If a line divides any two sides of a triangle in the same ratio, then the line must be parallel to the third side.

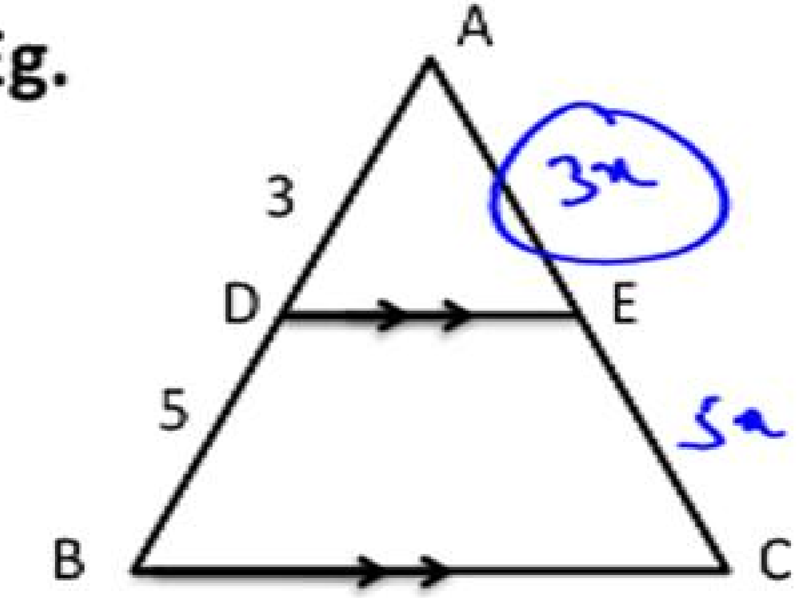
Converse of BPT



Given $\frac{AD}{DB} = \frac{AE}{EC}$

$DE \parallel BC$

Eg.



Given DE || BC

If $\frac{AD}{DB} = \frac{3}{5}$ **, AC = 11.2 cm**

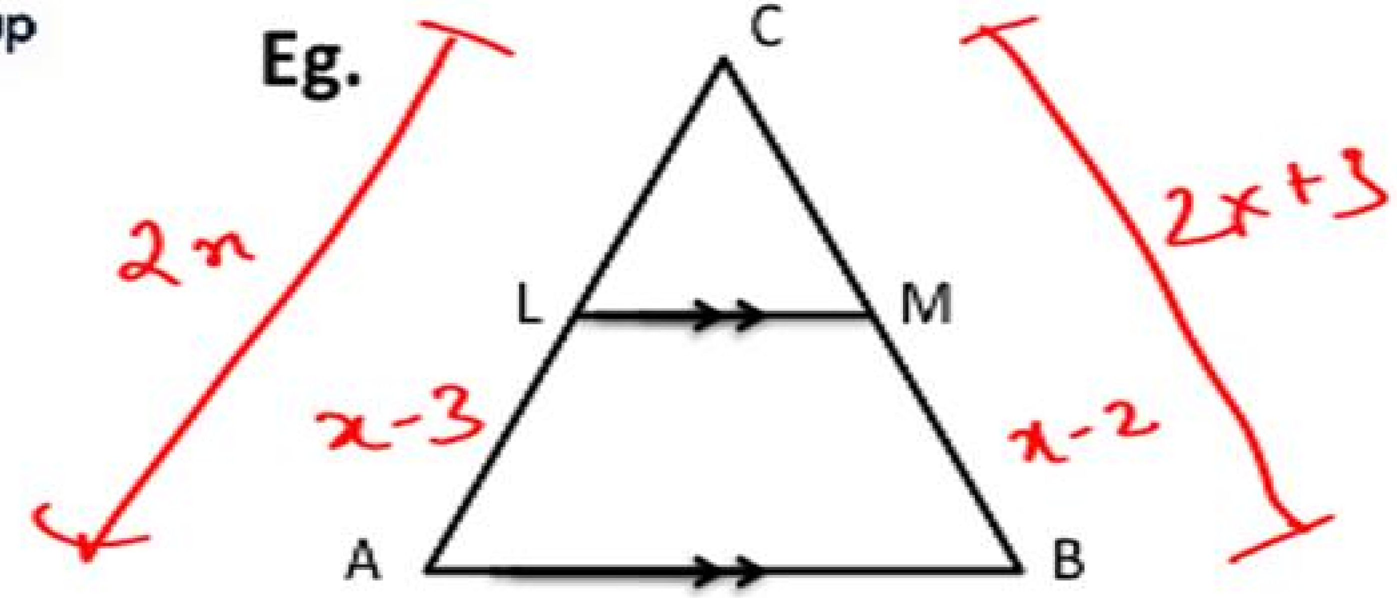
Find AE = ??

$8x = 11.2$

$x = 1.4$

$AE = \underline{\underline{4.2}}$

Eg.



If LM || AB
AL = *x* – 3 , AC = 2*x* , BM = *x* – 2, BC = 2*x* + 3
then *x* = ??

LM || AB

$$\frac{AL}{AC} = \frac{BM}{BC}$$

$$\frac{x-3}{2x} = \frac{x-2}{2x+3}$$

$$\cancel{2x^2} - 3x - 9 = \cancel{2x^2} - 4x$$

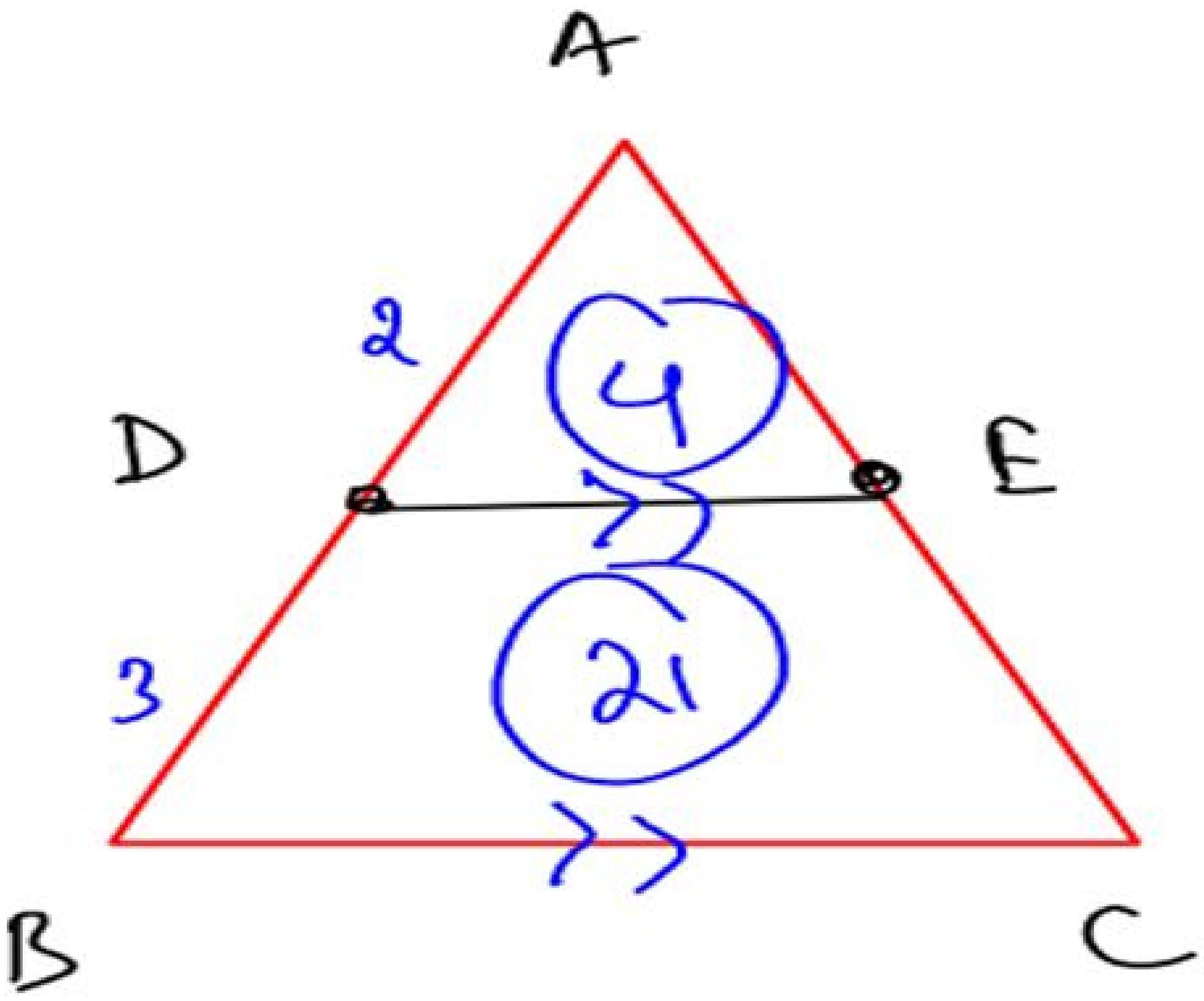
$$x = 9$$

Imp

Eg. In a ΔABC, D and E are taken on AB & AC in such a way that DE || BC and $\frac{AD}{DB} = \frac{2}{3}$.

Find : $\dfrac{Area\ of\ \ \Delta ADE}{Area\ of\ \ quadrilateral\ DECB} = ??$

$\frac{4}{21}$



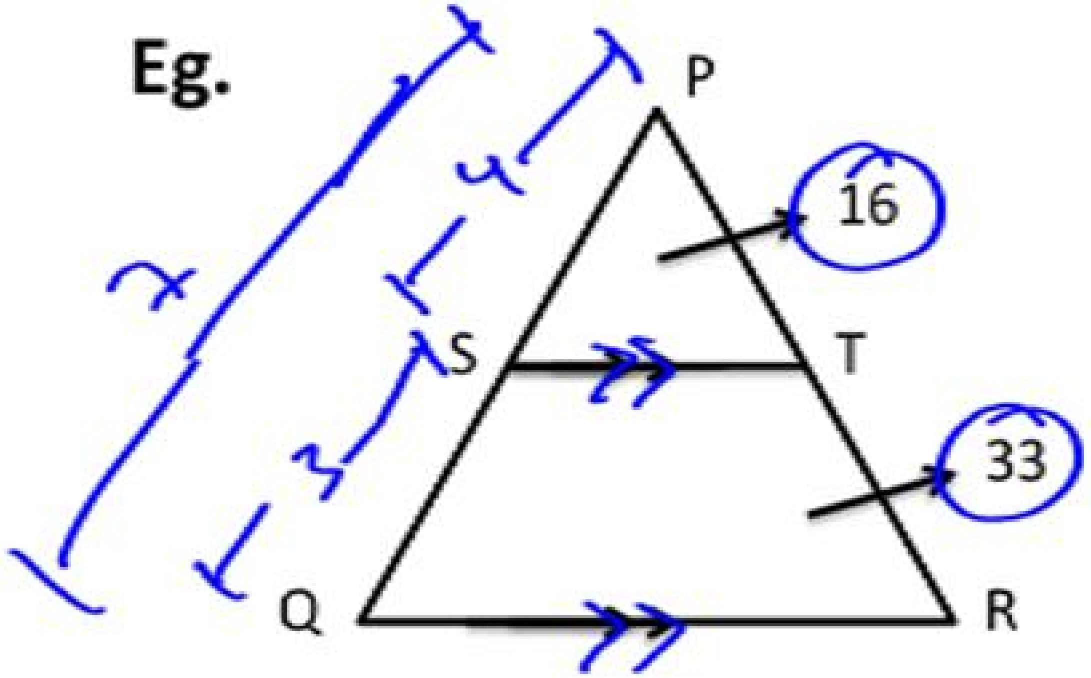
DE || BC

$\Delta ADE \sim \Delta ABC$

$\dfrac{\text{area of } \Delta ADE}{\text{area of } \Delta ABC} = \left(\dfrac{2}{5}\right)^2$

$\dfrac{\text{area of } \Delta ADE}{\text{area of } \Delta ABC} = \dfrac{4}{25}$

Eg.



If $\dfrac{Area\ of\ \Delta PST}{Area\ of\ quadrilateral\ STRQ} = \dfrac{16}{33}$

Find : $\dfrac{PS}{SQ} = ??$ $\quad \dfrac{4}{3}$

$$\frac{\text{area of } \Delta PST}{\text{area of } \Delta PQR} = \frac{16}{49}$$

$$\left(\frac{PS}{PQ}\right)^2 = \frac{16}{49}$$

$$\frac{PS}{PQ} = \frac{4}{7}$$

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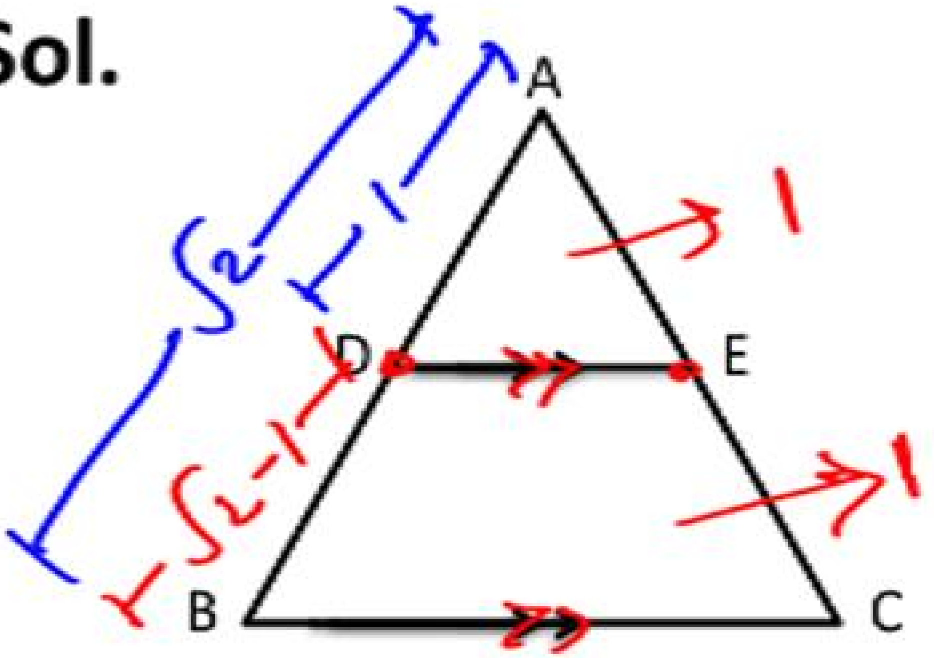
Eg. In a ΔABC, points D and E are taken on AB & AC in such that DE || BC and it divides the triangle in two equal areas. find AD : DB.

v. imp

Sol.



$$\frac{\text{Area of } \Delta ADE}{\text{Area of } \Delta ABC} = \frac{1}{2}$$

$$\left(\frac{AD}{AB}\right)^2 = \frac{1}{2}$$

$$\frac{AD}{AB} = \frac{1}{\sqrt{2}}$$

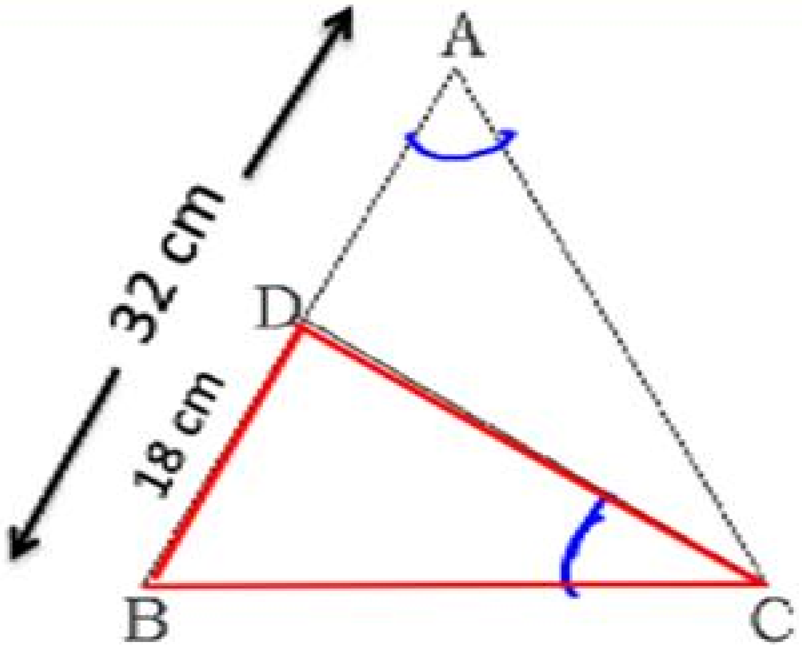
$$\boxed{\frac{AD}{DB} = \frac{1}{\sqrt{2}-1}}$$

Eg. In a $\triangle$ABC, points D and E are taken on AB & AC in such that DE || BC.

If $\frac{AD}{DB} = \frac{2}{5}$, find (Area of $\triangle$ADE : Area of $\triangle$DEB : Area of $\triangle$BEC)

Homework

Eg. In the given figure, $\angle BAC = \angle BCD$, AB = 32 cm and BD = 18 cm, then the ratio of perimeter of ΔBDC and ΔABC is:



(a) 4 : 3 (b) 8 : 5

(c) 5 : 8 (d) 3 : 4

$$\Delta BCD \sim \Delta BAC$$

$$\frac{BC}{BA} = \frac{BD}{BC}$$

$$BC^2 = 32 \cdot 18$$

$$BC = 24$$

$$\frac{\cancel{24}\ 3}{\cancel{32}\ 4}$$

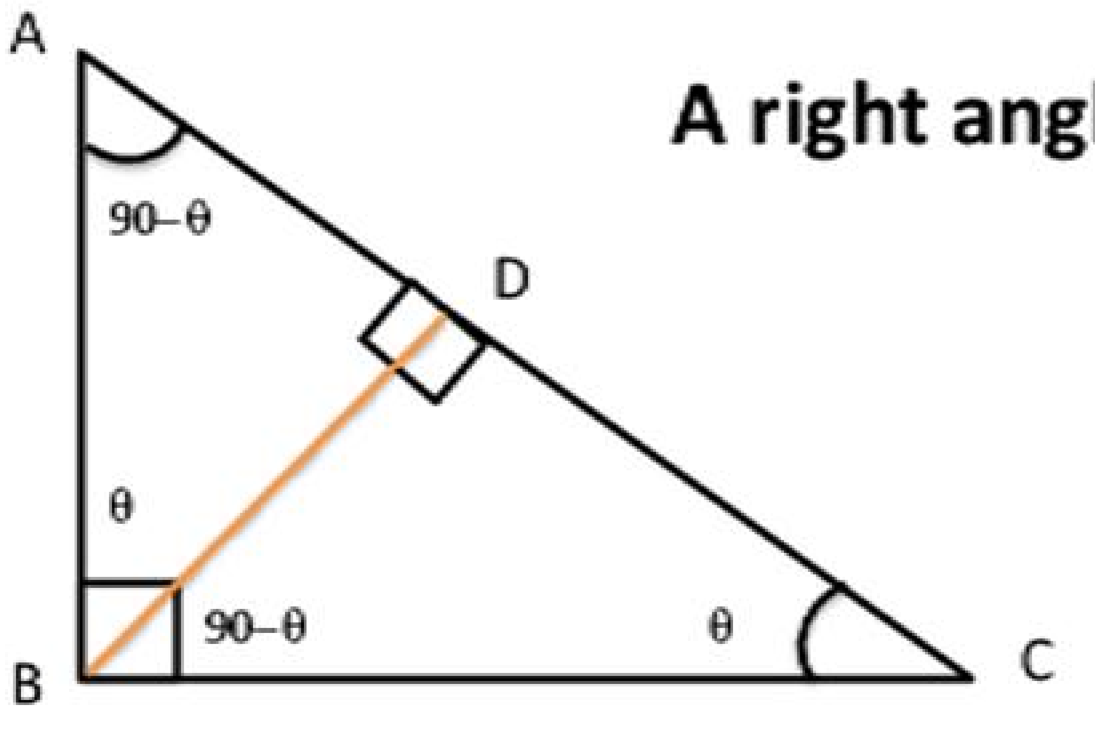
Eg. In ΔPQR, S and T are points on side PR and PQ respectively such that, $\angle PQR = \angle PST$. If PT = 5 cm, PS = 3 cm and TQ = 3 cm, then length of SR is

(a) 5 cm (b) 6 cm

(c) $\frac{31}{3}$ cm (d) $\frac{41}{3}$ cm

Homework

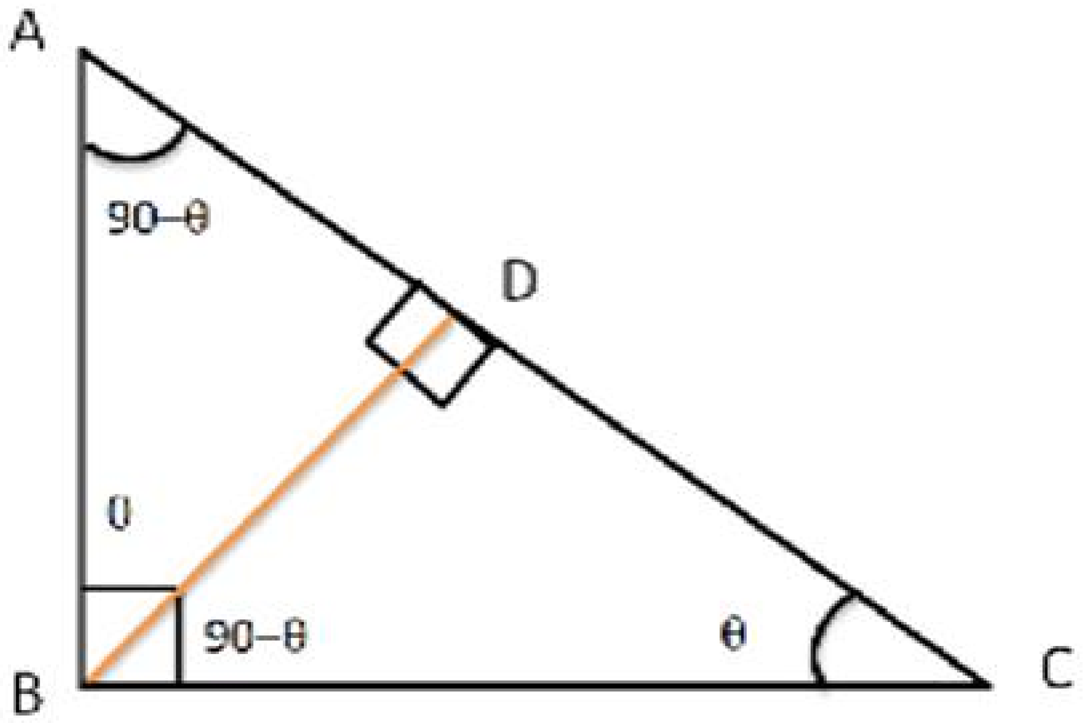
SIMILARITY IN RIGHT ANGLE TRIANGLE



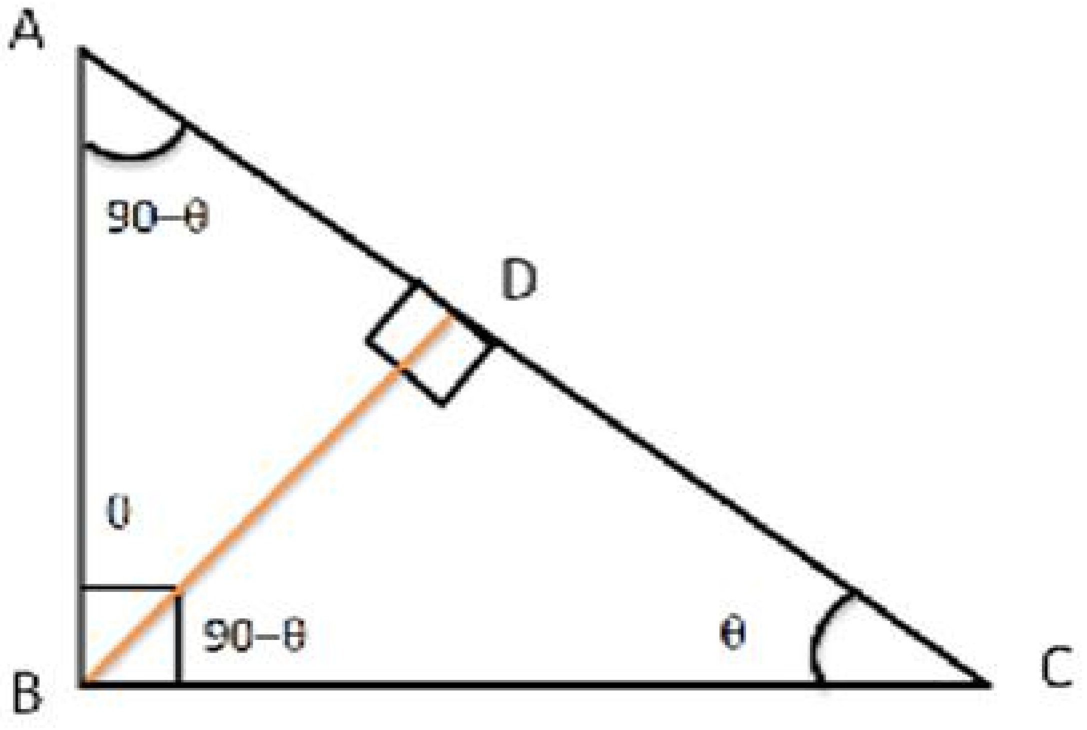
A right angle Δ, right angle at B and BD is perpendicular to AC.

$$\Delta ABC \sim \Delta ADB \sim \Delta BDC$$

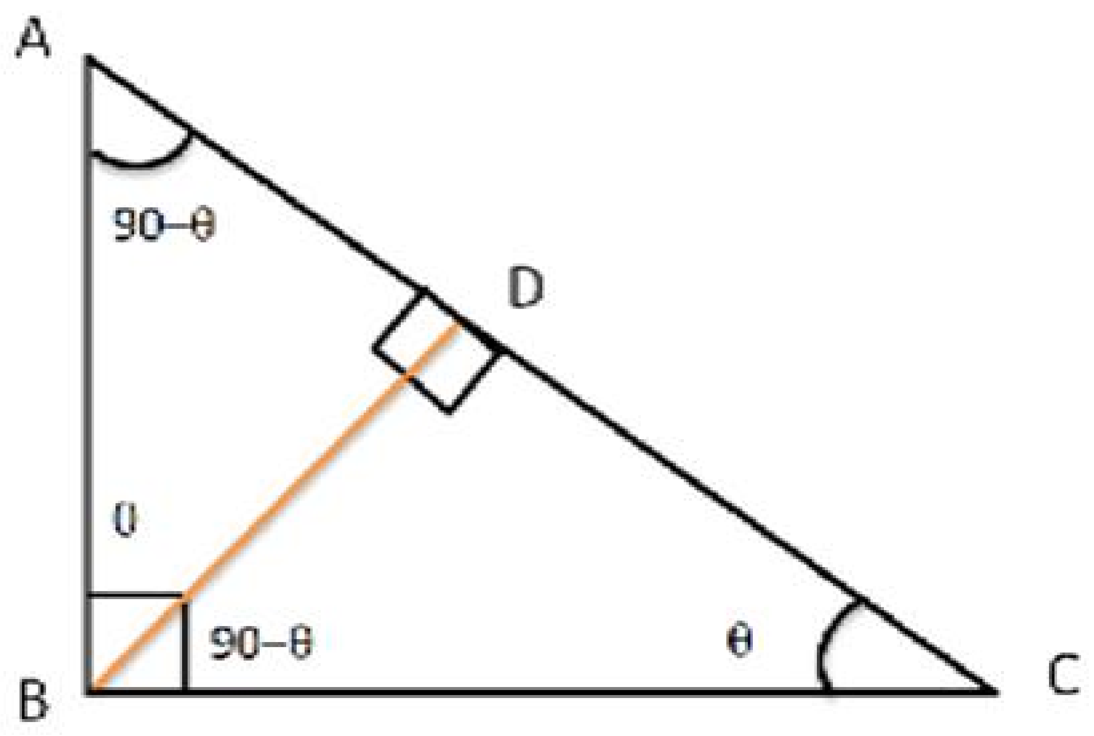
(1) A right angle Δ, right angle at B and BD is perpendicular to AC.



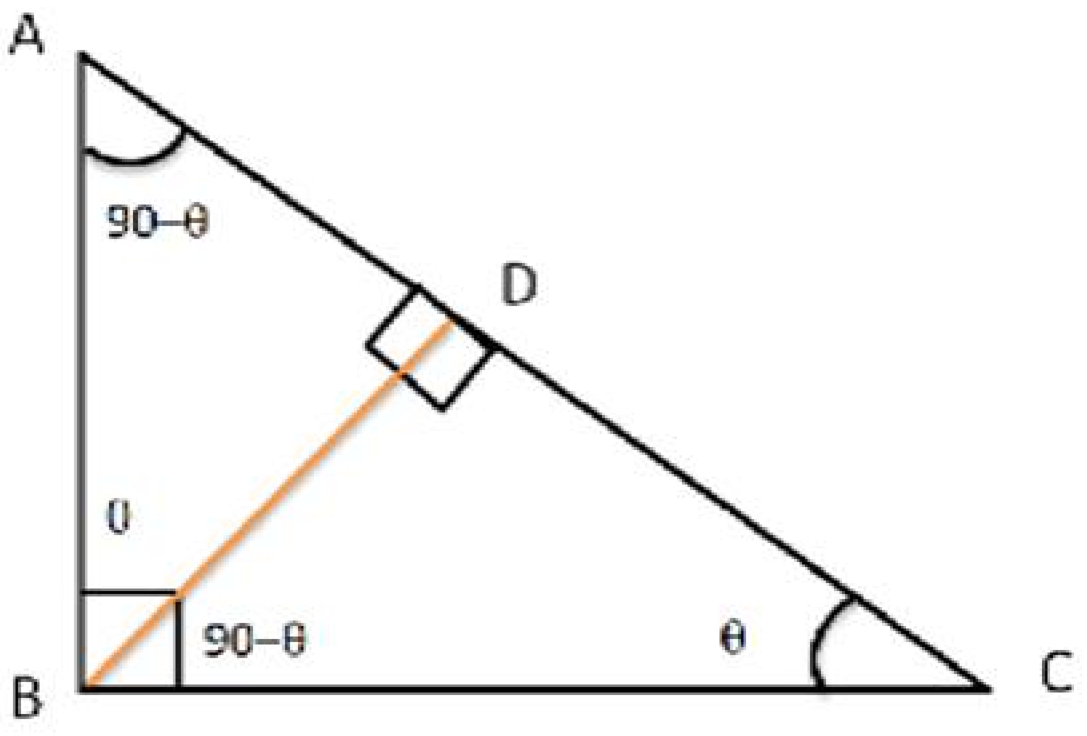
(2) A right angle Δ, right angle at B and BD is perpendicular to AC.



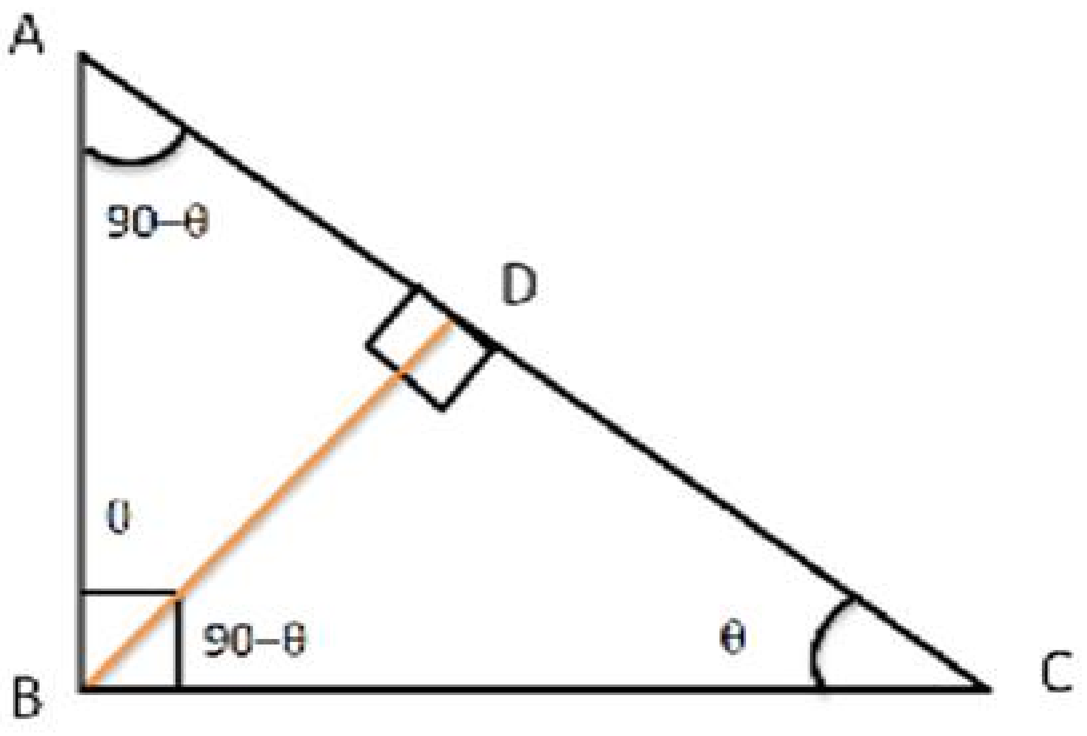
(3) A right angle Δ, right angle at B and BD is perpendicular to AC.

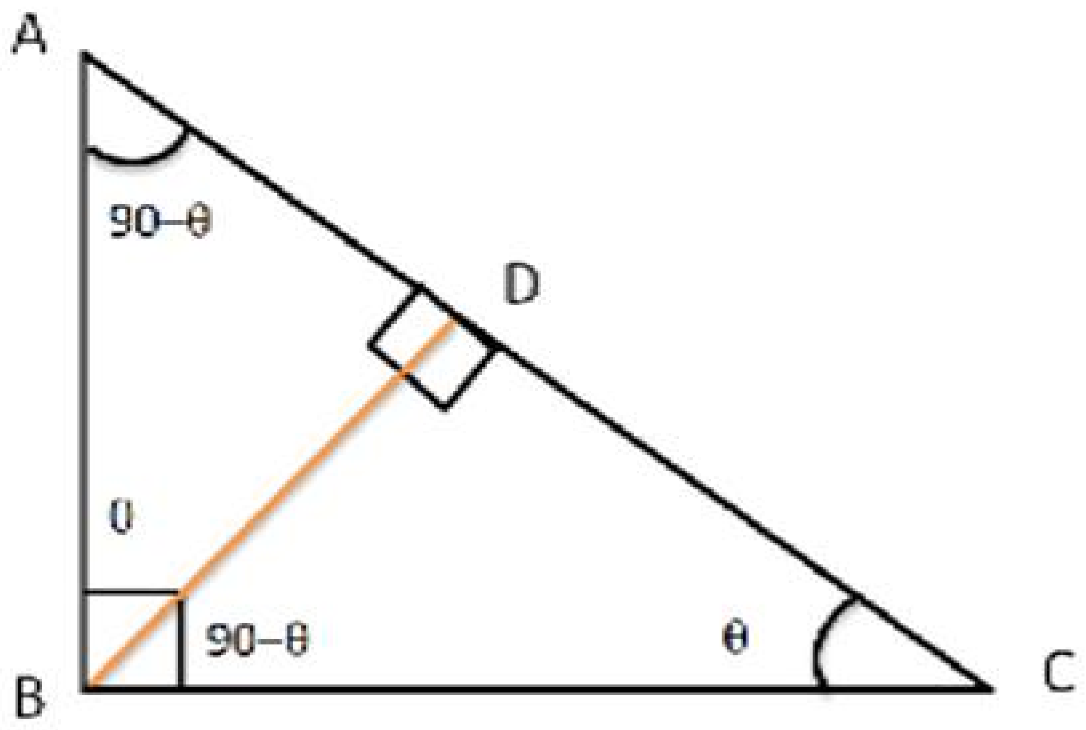


(4) A right angle Δ, right angle at B and BD is perpendicular to AC.



(5) A right angle Δ, right angle at B and BD is perpendicular to AC.





(1) $AB \times BC = AC \cdot BD$

(2) $BA^2 = AD \cdot AC$

(3) $BC^2 = CD \cdot CA$

(4) $BD^2 = DA \cdot DC$

(5) $\dfrac{1}{BD^2} = \dfrac{1}{AB^2} + \dfrac{1}{BC^2}$

EXAMPLES ON SIMILARITY IN RIGHT ANGLE Δ

Eg. In a $\triangle ABC$,

$AD \perp BC$ & $AD^2 = BD \cdot DC$

Find $\angle BAC = ??$

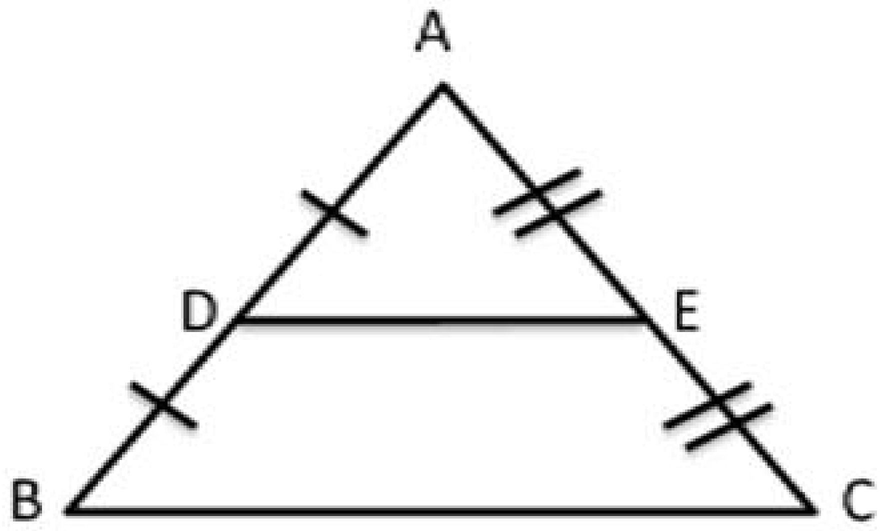
MID-POINT THEOREM

If we join mid-points of any 2 sides of a Δ by a line segment then that line segment will be parallel to the third side and half of it.

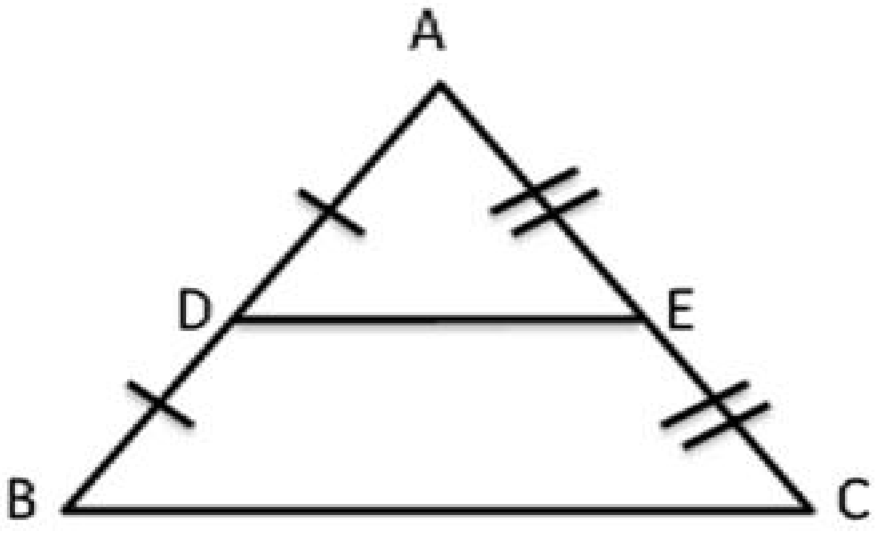
Eg. Given,
D is mid-point of AB.
E is mid-point of AC.

$$DE \,||\, BC$$

$$DE = \frac{1}{2} BC$$



Proof of Mid-point theorem:



Given, D, E are mid-point of AB & AC.

To prove: (i) $DE \,||\, BC$

(ii) $DE = \frac{1}{2} BC$

Proof: AD : AB = 1 : 2

AE : AC = 1 : 2

$\Delta ADE \sim \Delta ABC$ (SAS similarity)

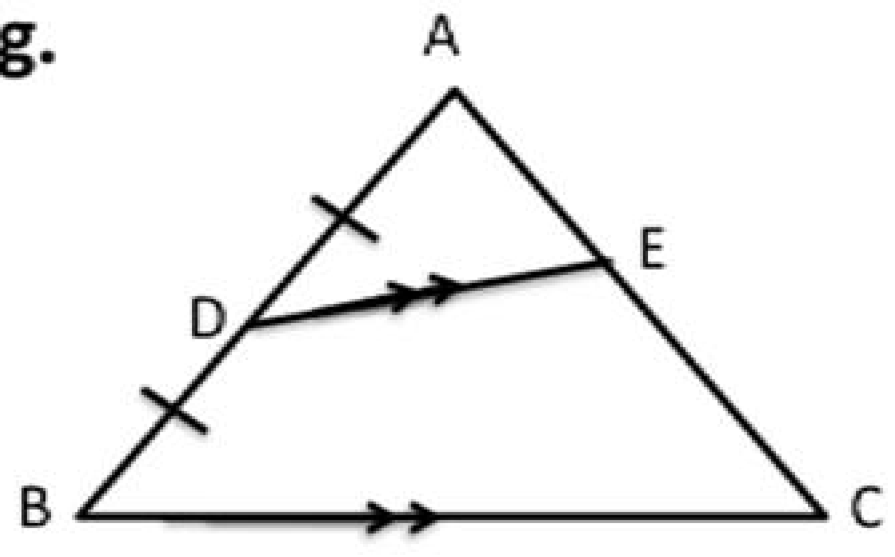
$\angle ADE = \angle ABC$ (Corresponding angles)

$DE \,||\, BC$

$$DE = \frac{1}{2} BC$$

CONVERSE OF MID-POINT THEOREM

Eg.



Given,

D is mid-point of AB.

DE ||BC

E is mid-point of AC.

PRACTICE QUESTIONS

Q1. If ΔFGH is isosceles and $FG < 3$ cm, $GH = 8$ cm, then of the following, the true relation is :

(a) $GH = FH$ (b) $GF = GH$

(c) $FH > GH$ (d) $GH < GF$

Ans. (a)

gradeup

Q2. If in ΔABC, $\angle C$ is obtuse and length of sides BC and AC are respectively 9 cm. and 7 cm., the minimum possible length of AB is (where length of AB is an integer)

(a) 11 cm (b) 12 cm

(c) 14 cm (d) 16 cm

Ans. (b)

Q3. $\angle A$, $\angle B$, $\angle C$ are three angle of a traingle. If $\angle A - \angle B = 15°$, $\angle B - \angle C = 30°$, then $\angle A$, $\angle B$ and $\angle C$ are :

(a) 80°, 60°, 40°

(b) 70°, 50°, 60°

(c) 80°, 65°, 35°

(d) 80°, 55°, 45°

Ans. (c)

gradeup

Q4. In a ΔPQR, the sum of the exterior angles of Q and R will be equal to:

(a) $180^\circ - \angle QPR$ (b) $180^\circ + \angle QPR$

(c) $180^\circ - 2\angle QPR$ (d) $180^\circ + 2\angle QPR$

Ans. (b)

gradeup

Q5. By decreasing 15° of each angle of a triangle, the ratio of their angles is 2 : 3 : 5, the measure of greatest angle is :

(a) $\frac{11}{24}\pi$

(b) $\frac{\pi}{12}$

(c) $\frac{\pi}{24}$

(d) $\frac{5}{24}\pi$

Ans. (a)

gradeup

Q6. In an Isosceles ΔABC, AB = AC = 17 cm. D is a point on side BC such that CD = 4cm and AD 15 cm, then find length of BD = ?

(a) 16 (b) 8

(c) 4 (d) 15

Ans. (a)

gradeup

Q7. Let ABC be an equilateral triangle. If the side BC is produced to the point D so that BC = 2CD, then AD^2 is equal to :

(a) $3CD^2$
(b) $4CD^2$
(c) $5CD^2$
(d) $7CD^2$

Ans. (d)

gradeup

Q8. In a ΔABC, $AC = 20$ cm and $BC = 10$ cm. If area of triangle is $80\ cm^2$, then find the length of AB :

(a) $3\sqrt{39}$ (b) $2\sqrt{78}$

(c) $2\sqrt{52}$ (d) $2\sqrt{65}$

Ans. (d)

Q9. In ΔABC, $AB = AC$, D is any point on side BC, find $AB^2 - AD^2$.

(a) $CD \times AB$

(b) $BD \times CD$

(c) $BD \times AB$

(d) None of these

Ans. (b)

Q10. If A is the area of a right angled triangle and b is one of the sides containing the right angle, then what is the length of the altitude on the hypotenuse ?

(a) $\frac{2Ab}{\sqrt{b^4 + 4A^2}}$ (b) $\frac{2A^2b}{\sqrt{b^4 + 4A^2}}$

(c) $\frac{2Ab^2}{\sqrt{b^4 + 4A^2}}$ (d) $\frac{2A^2b^2}{\sqrt{b^4 + A^2}}$

Ans. (a)

Q11. In a right angled triangle, the product of two sides is equal to half of the square of the third side i.e. hypotenuse. One of the acute angle must be :

(a) 60° (b) 30°

(c) 45° (d) 15°

Ans. (c)

Q12. A point D is taken from the side BC of a right-angled triangle ABC, where AB is hypotenuse then

(a) $AB^2 + CD^2 = BC^2 + AD^2$
(b) $CD^2 + BD^2 = 2AD^2$
(c) $AB^2 + AC^2 = 2AD^2$
(d) $AB^2 = AD^2 + BD^2$

Ans. (a)

Q13. In a right angled ΔABC, $\angle B = 90°$ if P and Q are two points on sides AB and BC respectively then–

(a) $AQ^2 + CP^2 = AC^2 + PQ^2$

(b) $AQ^2 + CP^2 = \frac{1}{2}(AC^2 + PQ^2)$

(c) $AQ^2 + CP^2 = 2(AC^2 + PQ^2)$

(d) $AQ^2 + AC^2 = CP^2 + PQ^2$

Ans. (a)

Q14. The length of radius of a circumcircle of a triangle having sides 3 cm, 4 cm and 5 cm is :

(a) 2 cm
(b) 2.5 cm
(c) 3 cm
(d) 1.5 cm

Ans. (b)

Q15. If the length of the sides of a triangle are in the ratio 4 : 5 : 6 and the inradius of the triangle is 3 cm, then the altitude of the triangle corresponding to the largest side as base is :

(a) 7.5 cm (b) 6 cm
(c) 10 cm (d) 8 cm

Ans. (a)

gradeup

Q16. The three sides of a triangle are 15, 25, x units which one of the following is correct.

(a) $10 < x < 40$ (b) $20 < x < 40$

(c) $30 < x < 40$ (d) $10 < x < 30$

gradeup

Ans. (a)

Q17. Two sides of a Δ are 13 cm and 5 cm. How many different values of 3rd side are possible where the length of 3rd side is integer.

(a) 8 (b) 9

(c) 10 (d) 10

Ans. (b)

Q18. Perimeter of a Δ is 12 cm. How many different Δ (traingle) can be formed.

(a) 6 (b) 5

(c) 4 (d) 3

Ans. (d)

gradeup

Q19. If ΔFGH is isosceles and $FG < 3$ cm, $GH = 8$ cm, then of the following, the true relation is :

(a) $GH = FH$ (b) $GF = GH$

(c) $FH > GH$ (d) $GH < GF$

Ans. (a)

gradeup

Q20. If the measure of the sides of triangle are $(x^2 - 1)$, $(x^2 + 1)$ & $2x$ cm, then the triangle will be :

(a) Equilateral

(b) Acute-Angled

(c) Isosceles

(d) Right angle

Ans. (d)

gradeup

Q21. If the sides of a triangle are in the ratio $3 : 1\frac{1}{4} : 3\frac{1}{4}$, then the triangle is

(a) Right angle triangle
(b) Obtuse angle triangle
(c) Equilateral triangle
(d) Acute angle triangle

Ans. (a)

Q22. The sides of a triangle are 14 cm, 12 cm, 8 cm respectively the triangle is

(a) Right angle triangle
(b) Obtuse angle triangle
(c) Equilateral triangle
(d) Acute angle triangle

Ans. (d)

gradeup

Q23. If the three angles of a triangle are : $(k + 15)^\circ$, $\left(\frac{2k}{3}+30\right)^\circ$ and $\left(\frac{6k}{5}+6\right)^\circ$, then the triangle is :

(a) Scalene
(b) Equilateral
(c) Right angle
(d) Isosceles

Ans. (b)

gradeup

Q24. In a ΔABC, Median AD is perpendicular to side AB. Find the value of $\frac{\tan A}{\tan B}$

(a) 1 (b) –1

(c) 2 (d) –2

Ans. (d)

gradeup

Q25. If an isoscles ΔPQR has sides $PR = QR$ and $PQ^2 = 2PR^2$ then $\angle R = ?$

(a) 60° (b) 30°

(c) 45° (d) 90°

Ans. (d)