

Median $\rightarrow m_1, m_2, m_3$

① any Δ (किसी भी त्रिकोण)

$$S = \frac{m_1 + m_2 + m_3}{2}$$

$$\begin{array}{c} 13, 14, 15 > 84 \\ 10, 12, 21 \end{array}$$

$$\Delta \text{का क्षेत्र} = \frac{4}{3} \times \sqrt{S(S-m_1)(S-m_2)(S-m_3)}$$

ii) $m_1, m_2, m_3 \rightarrow$ Triplet's

$$\Delta \text{का क्षेत्र} = \frac{4^2}{3} \times \frac{1}{2} \times m_1 \times m_2 = \frac{2}{3} m_1 \times m_2$$

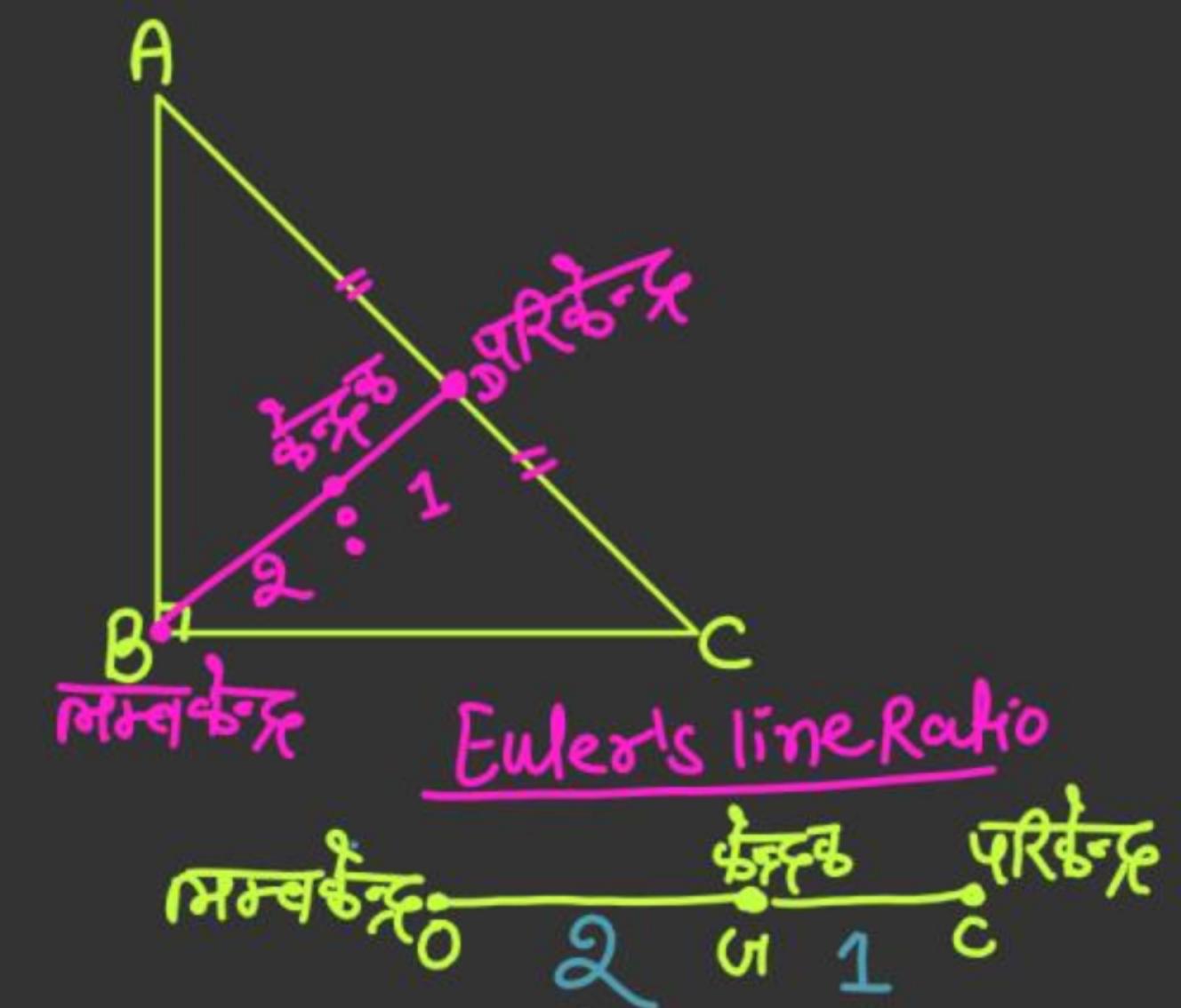
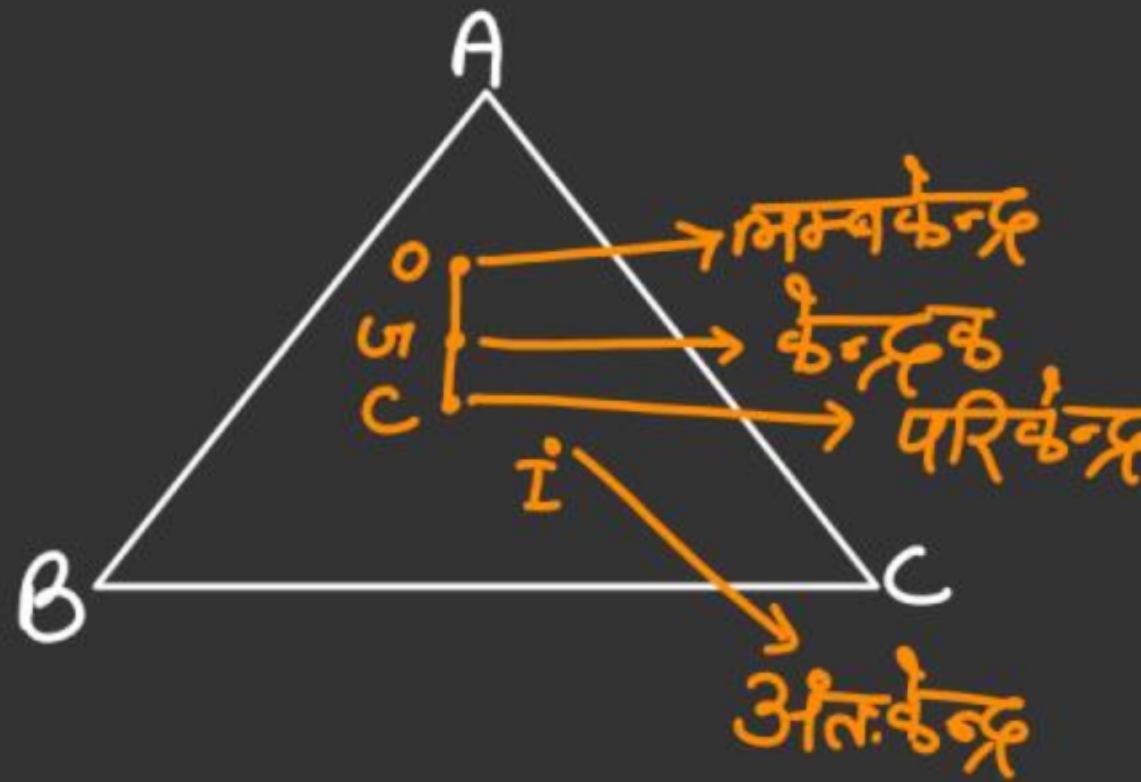
① Median $\rightarrow 13\text{cm}, 14\text{cm}, 15\text{cm}$

$$\begin{aligned} \Delta \text{का क्षेत्र} &= \frac{4}{3} \times \frac{28}{2} \times \frac{84}{2} \\ &= 112\text{cm}^2 \end{aligned}$$

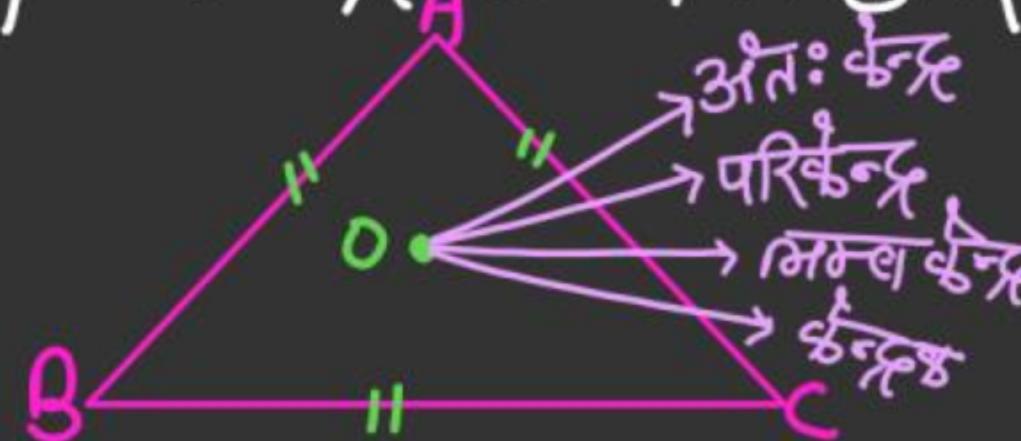
② 6cm, 8cm, 10cm

$$\begin{aligned} \Delta \text{का क्षेत्र} &= \frac{2}{3} \times m_1 \times m_2 \\ &= \frac{2}{3} \times 6 \times 8 \\ &= 32\text{cm}^2 \end{aligned}$$

Note: → i

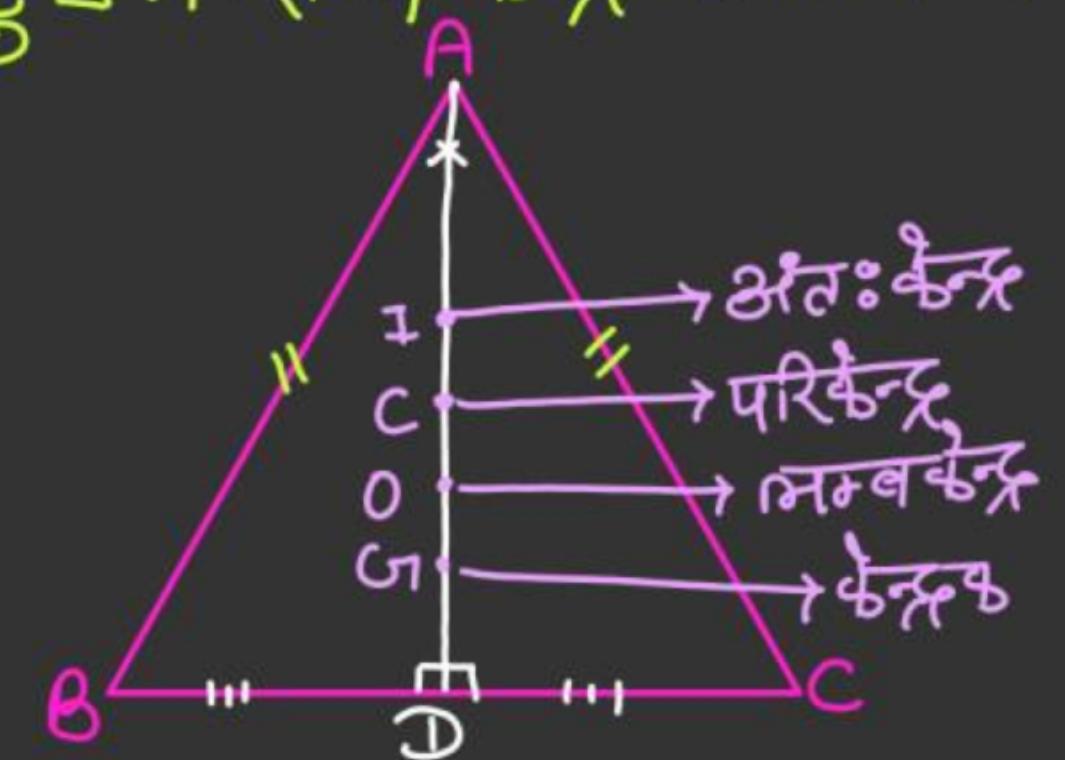


ii) समबाहु त्रिभुज के एवं समी-भासी के लिए विन्दु पर
स्थित होती हैं।



$$\frac{2}{1} \times 14 = 28\text{cm}$$

iii) अनमित्तिगांठ \triangle में सभी केन्द्र एक ही रेखा पर स्थित होते हैं। अर्थात् सर्वरिक्षणीय हैं।

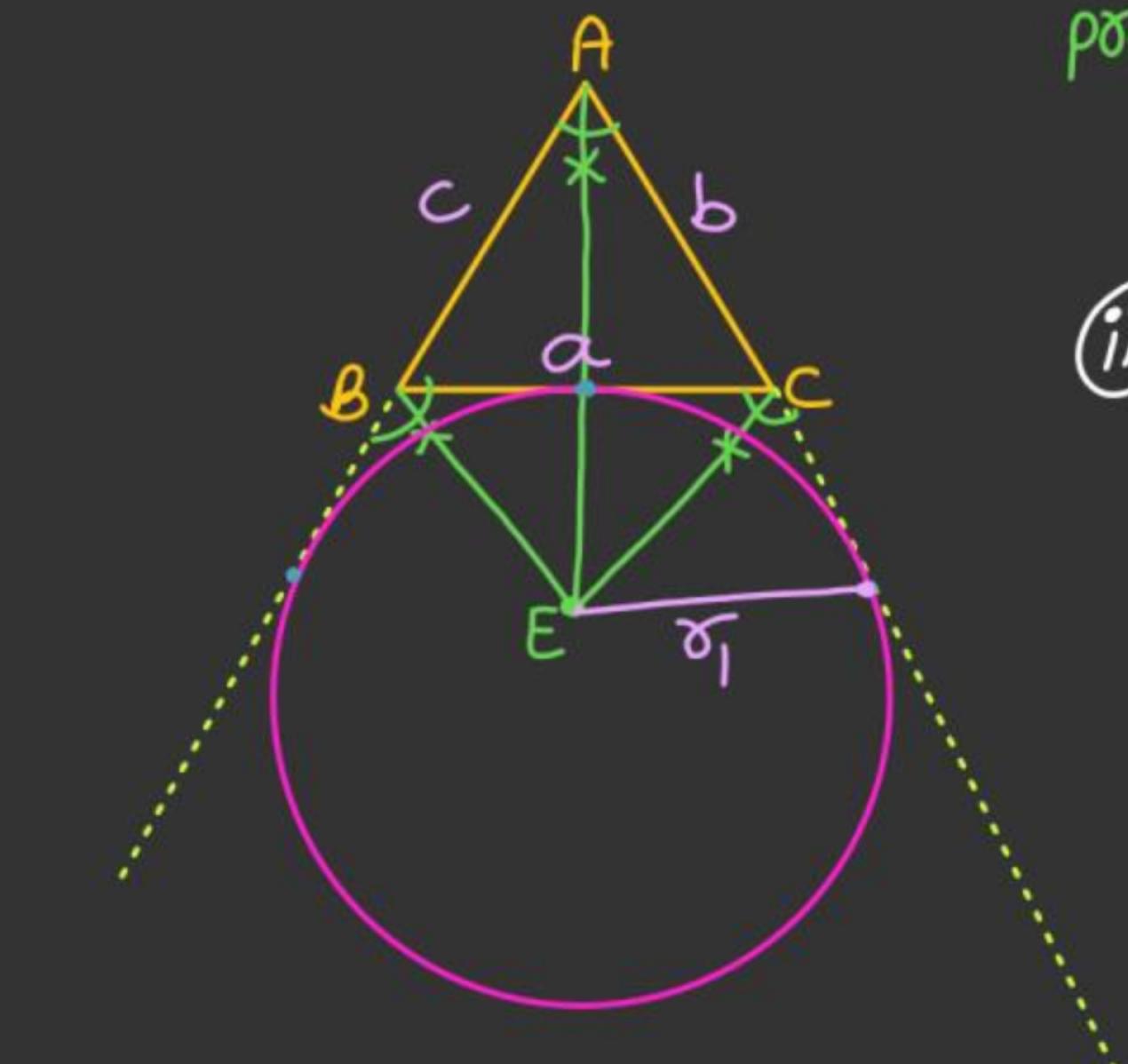


5) बाह्य केंद्र (Ex-centre): →

$$iii) r_1 = \frac{\Delta}{s-a}$$

$$r_2 = \frac{\Delta}{s-b}$$

$$r_3 = \frac{\Delta}{s-c}$$



Properties (गुण): → i) बाह्य केंद्र उम्मेदा Δ के बाहर स्थित होता है।

ii) बाह्य केंद्र के केंद्र पर बनाया गया कोण एक लम्बकोण तथा शिख कोण आदि के अंतर के बराबर होती है।

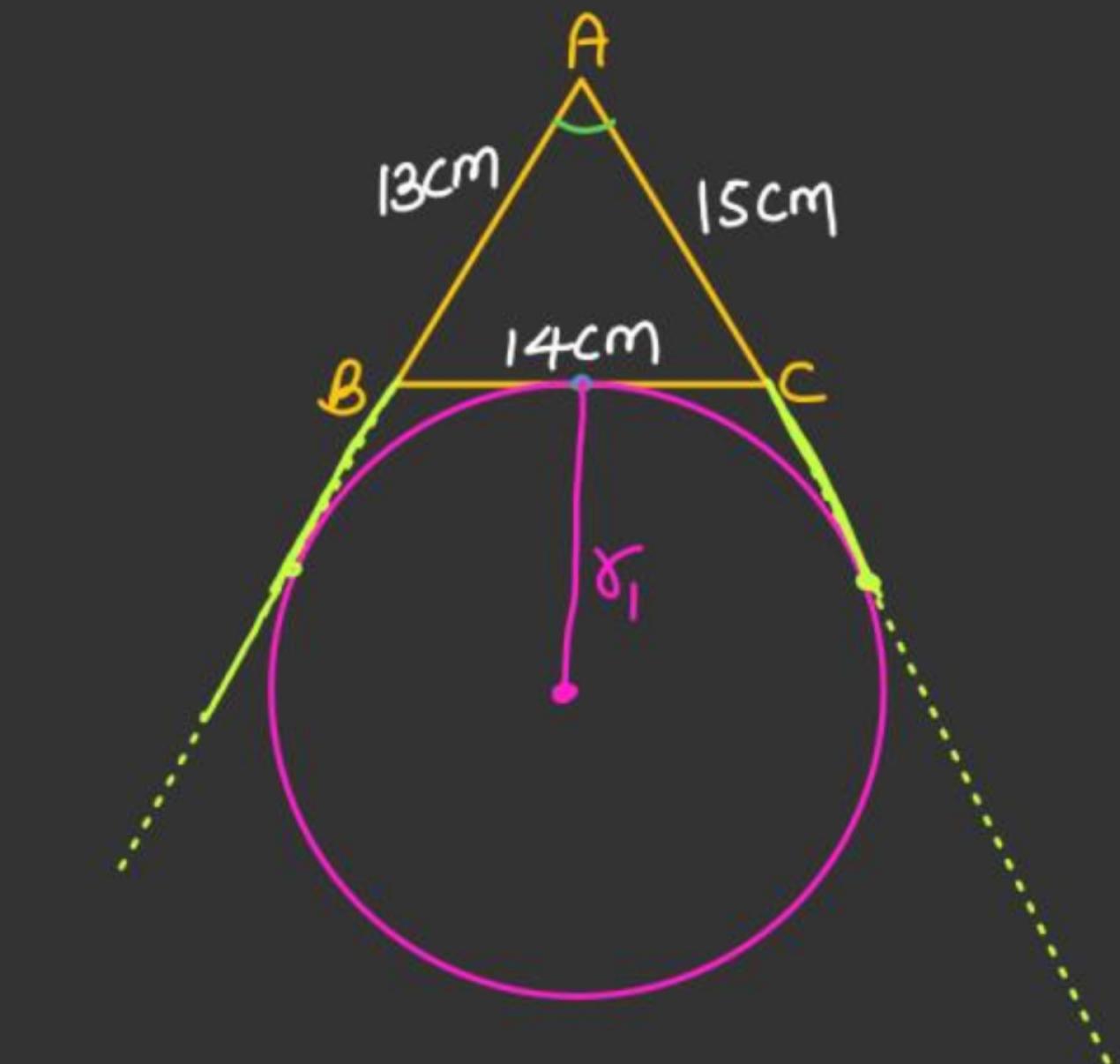


5) ව්‍යුත්ක්‍රෝ (Ex-centre) : →

$$iii) r_1 = \frac{\Delta}{s-a}$$

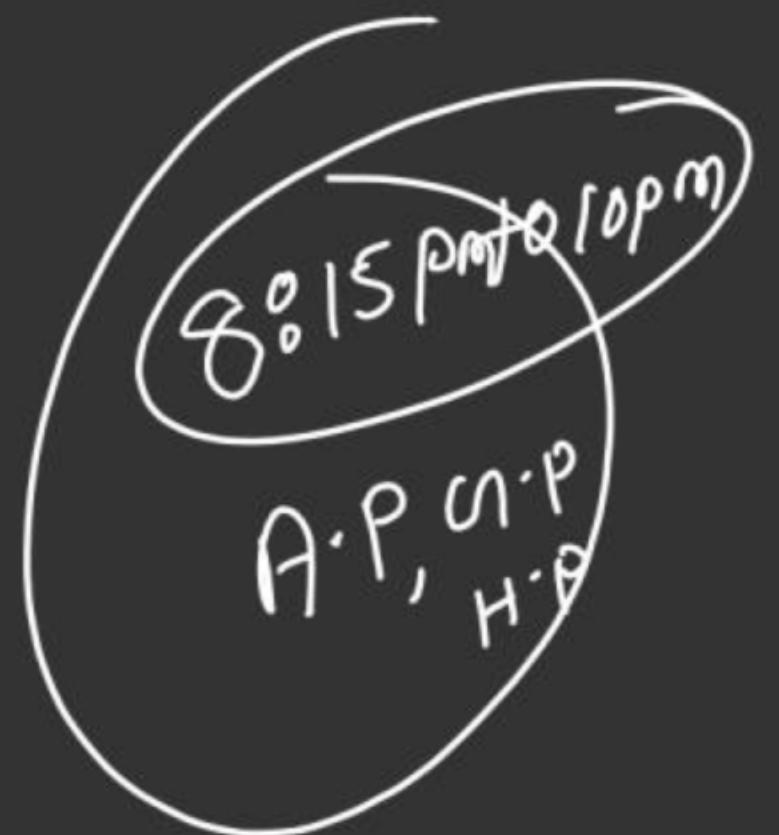
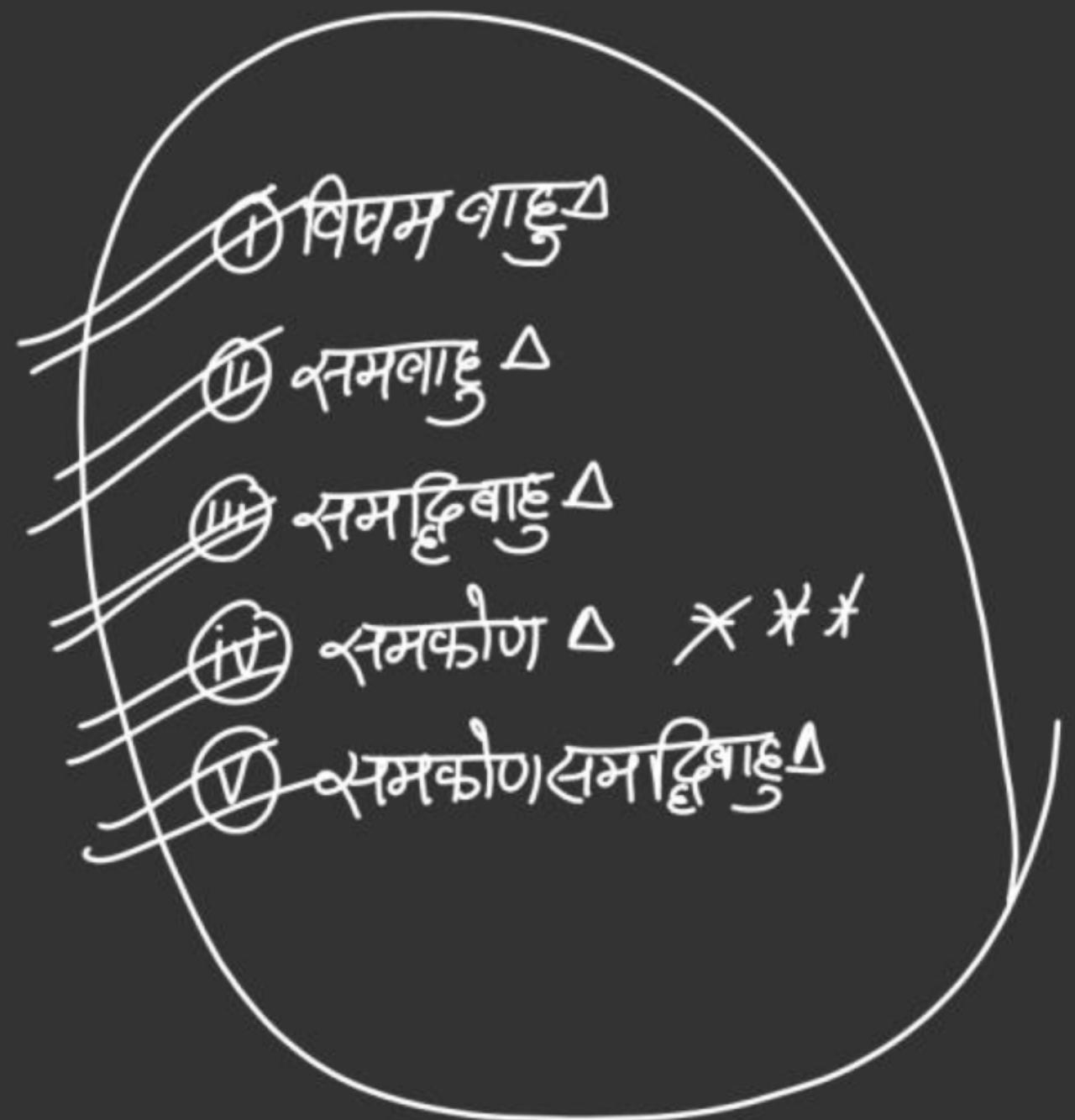
$$r_2 = \frac{\Delta}{s-b}$$

$$r_3 = \frac{\Delta}{s-c}$$

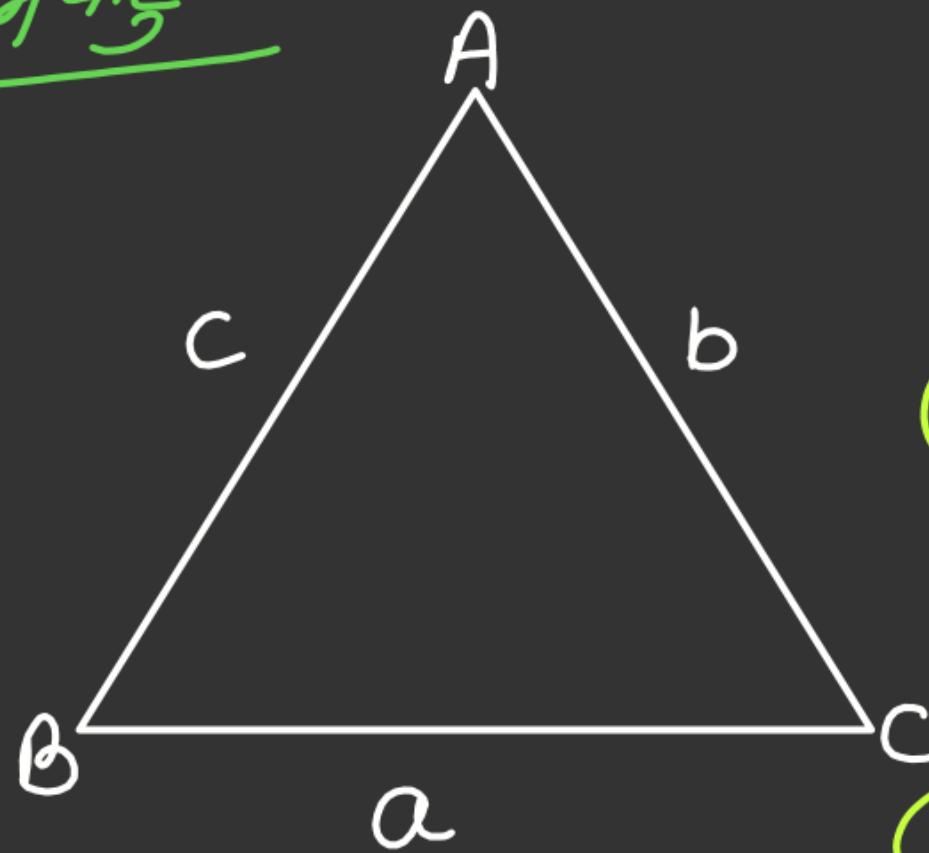


$$r_1 = \frac{\Delta}{s-a} = \frac{84}{21-14} = \frac{84}{7} = 12 \text{ cm}$$

$$s = \frac{13+14+15}{2} = 21$$



विषम त्रिभुज



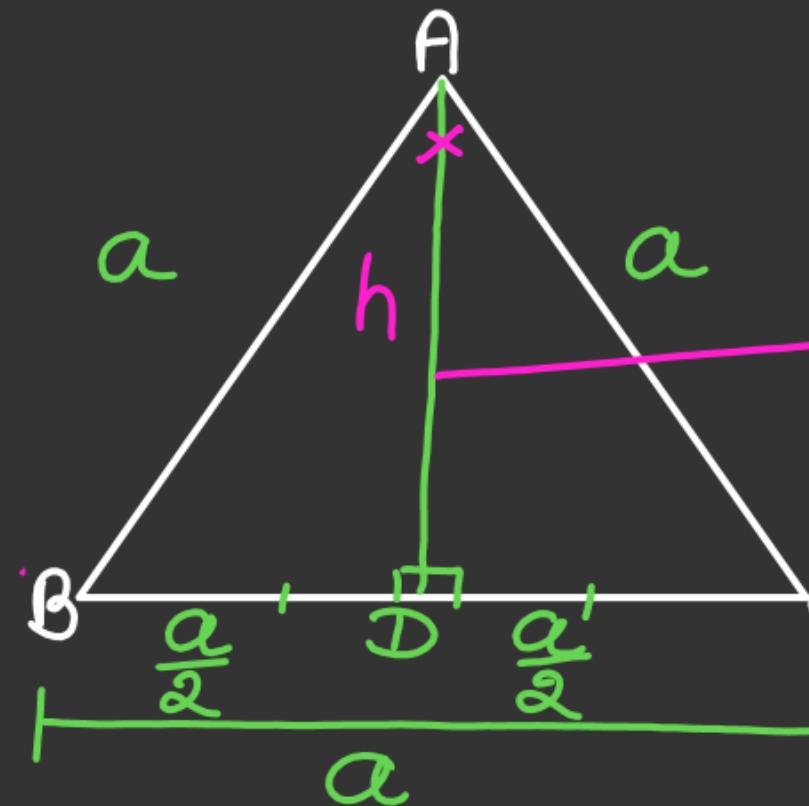
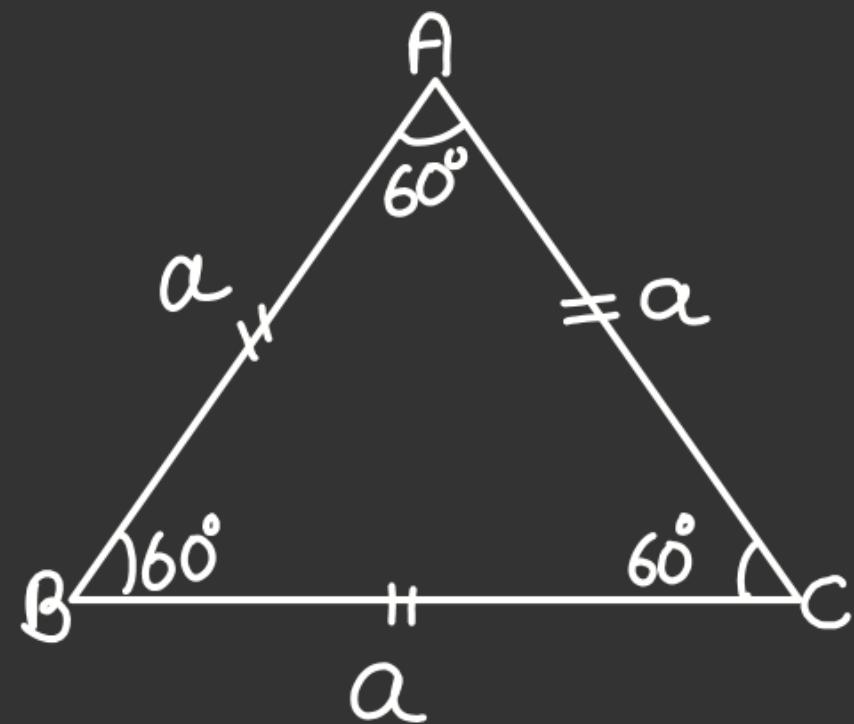
i) परिमाप (Perimeter) = $a + b + c$

ii) अर्धपरिमाप (Semiperimeter) = $\frac{a+b+c}{2}$

$$S = \frac{a+b+c}{2}$$

iii) त्रिकोण का क्षेत्रफल = $\sqrt{S(S-a)(S-b)(S-c)}$

समबाहु त्रिभुज (Equilateral Triangle)



कृत्यार्थ | भागिका | कोण समद्विभाजक |
भूम्बल समद्विभाजन

$$\text{AD} = \sqrt{a^2 - \frac{a^2}{4}} = \sqrt{\frac{3a^2}{4}} = \frac{\sqrt{3}a}{2}$$

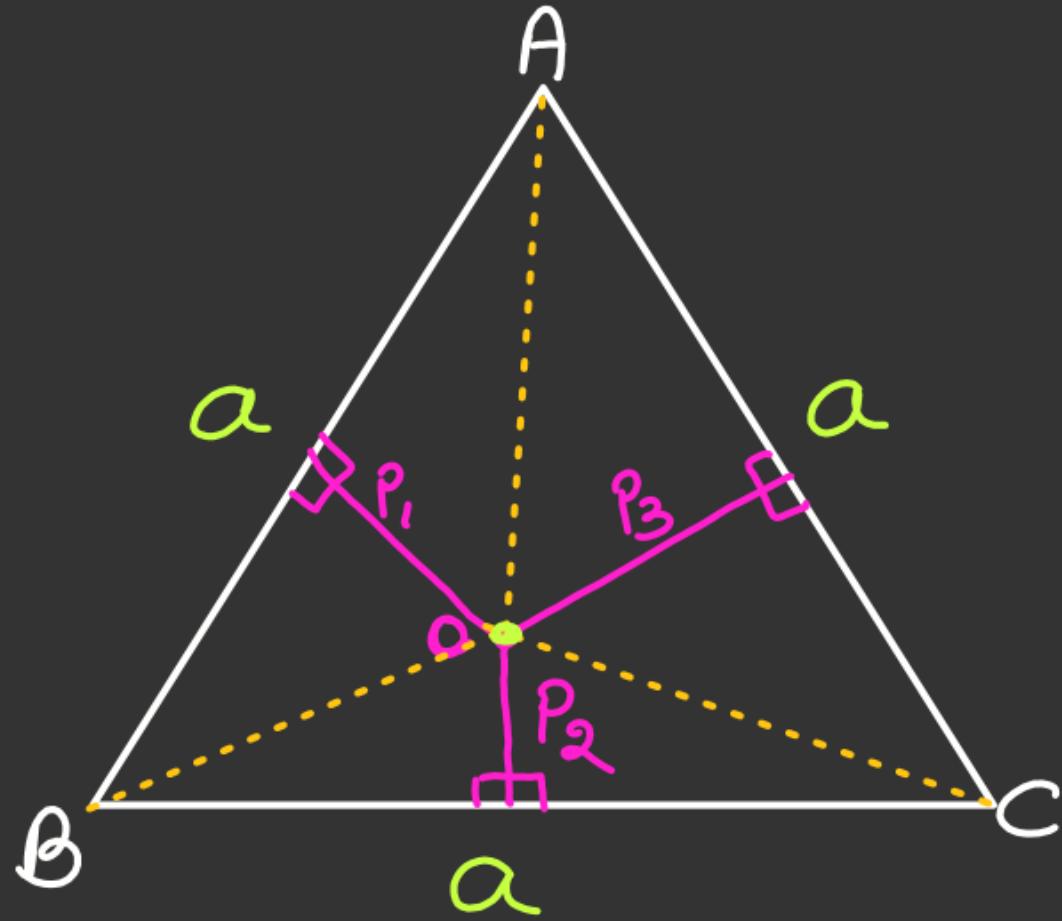
i) परिमाप (Perimeter) $\rightarrow 3a$

ii) कृत्यार्थ (h) $\rightarrow \frac{\sqrt{3}}{2} \times a$

iii) क्षेत्रफल (Area) $\rightarrow \frac{\sqrt{3}}{4} a^2 = \frac{h^2}{\sqrt{3}}$

iv) $r = \frac{a}{2\sqrt{3}}$ $r : R = 1 : 2$

v) $R = \frac{a}{\sqrt{3}}$ Area $\rightarrow 1 : 4$



$$\text{Area} = \frac{\sqrt{3}}{4} \times \frac{4}{\sqrt{3}} \sqrt{3} (P_1 + P_2 + P_3)^2$$

$$= \frac{(P_1 + P_2 + P_3)^2}{\sqrt{3}} = \frac{h^2}{\sqrt{3}}$$

$$\alpha \sigma \Delta ABC = \alpha \sigma \Delta AOB + \alpha \sigma \Delta BOC + \alpha \sigma \Delta AOC$$

$$\frac{\sqrt{3}}{4} \times a^2 = \frac{1}{2} \times a \times P_1 + \frac{1}{2} \times a \times P_2 + \frac{1}{2} \times a \times P_3$$

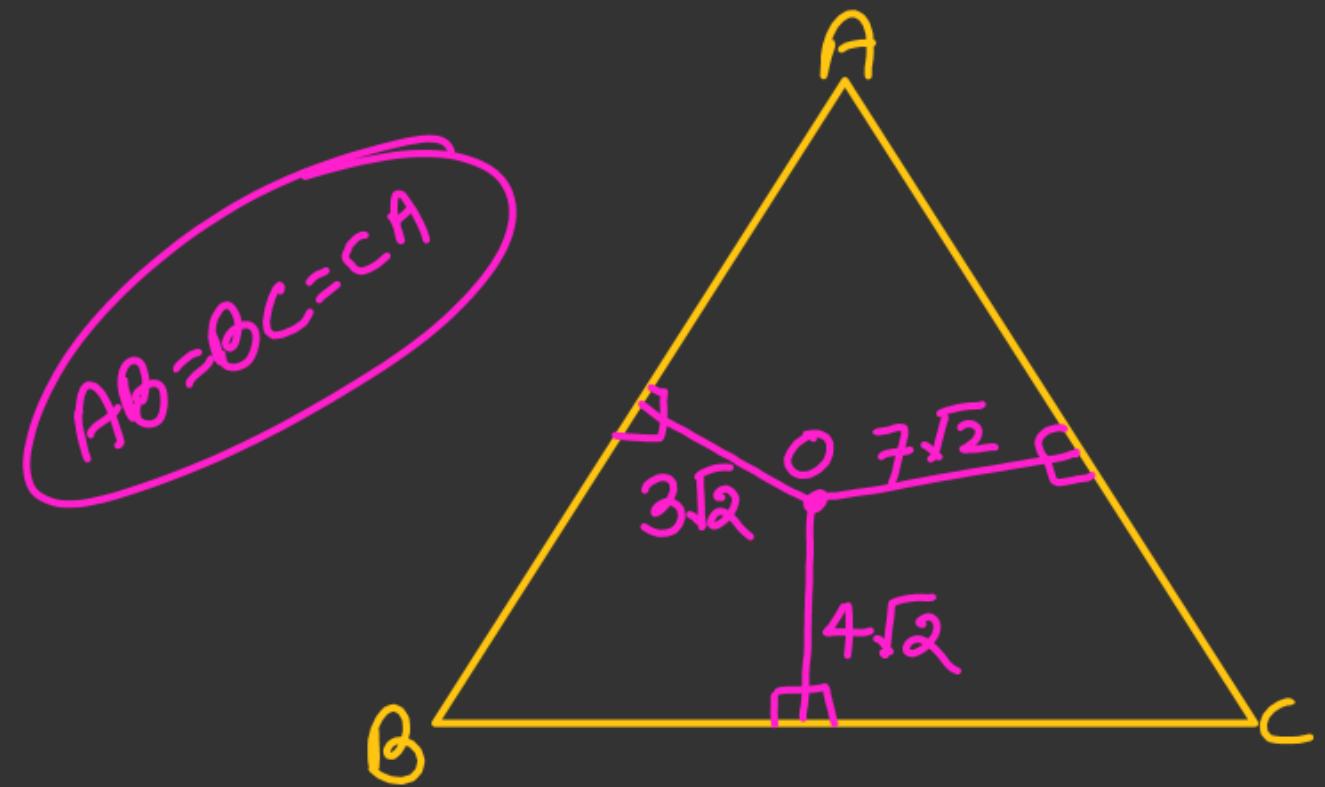
$$\frac{\sqrt{3}}{2} a^2 = \frac{1}{2} \times a [P_1 + P_2 + P_3]$$

$$\frac{\sqrt{3}a}{2} = P_1 + P_2 + P_3$$

i) $h = P_1 + P_2 + P_3$

ii) $a = \frac{2}{\sqrt{3}} (P_1 + P_2 + P_3)$

iii) $\text{Area} = \frac{\sqrt{3}}{4} \times \left[\frac{2}{\sqrt{3}} (P_1 + P_2 + P_3) \right]^2$



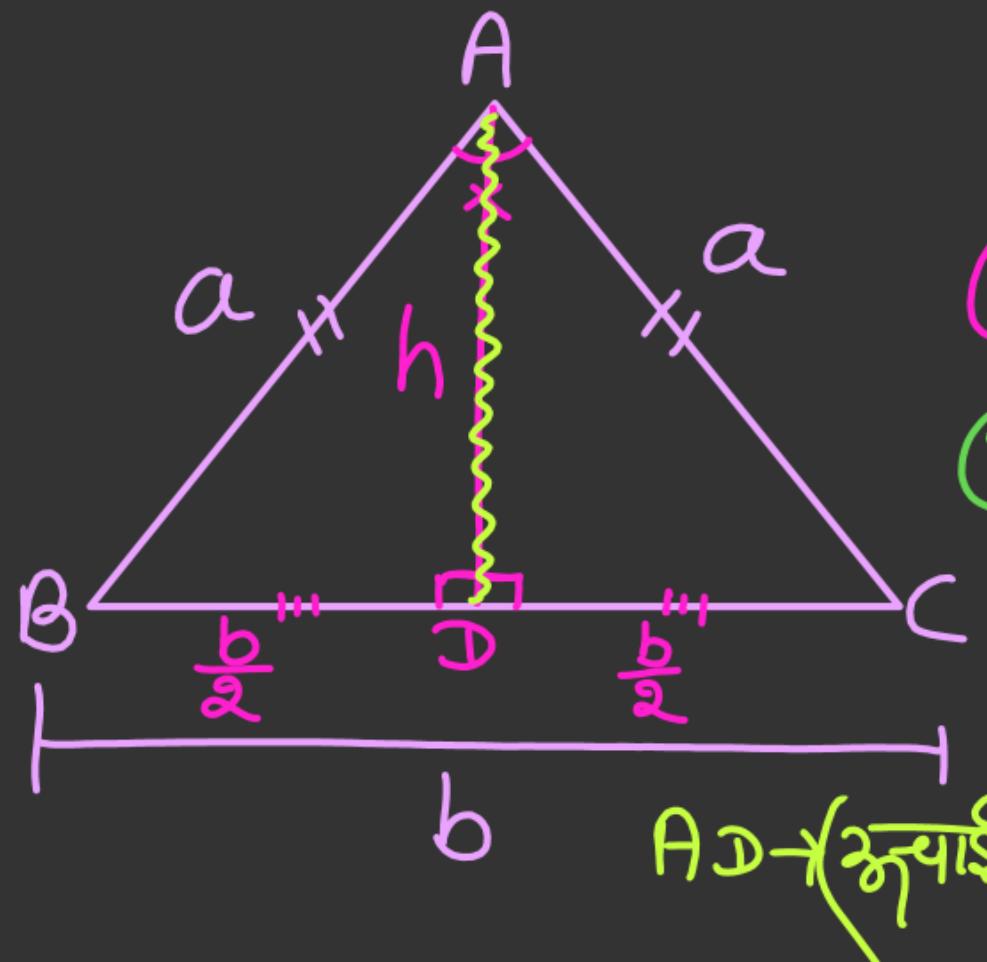
$$\textcircled{i} h = 14\sqrt{2}$$

$$\textcircled{II} \text{Area} = \frac{h^2}{\sqrt{3}} = \frac{(14\sqrt{2})^2}{\sqrt{3}} = \frac{196 \times 2}{\sqrt{3}} = \frac{392}{\sqrt{3}} \text{ cm}^2$$

$$\text{Area} =$$

Isosceles Triangle

→ समाद्विबाहु त्रिकोण

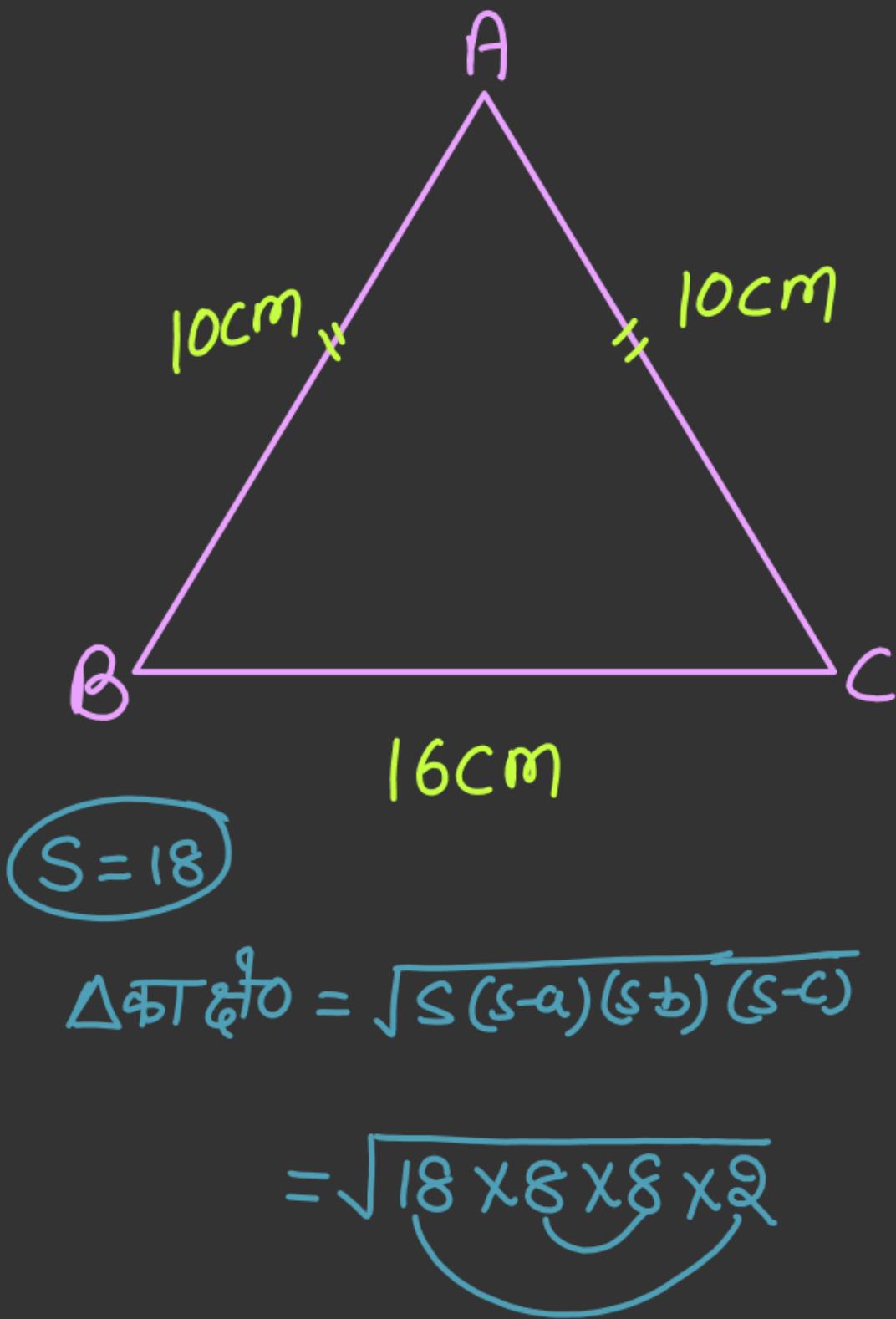


$$\textcircled{i} \text{ परिमाप } (P) = 2a + b$$

$$\textcircled{ii} \text{ ऊँचाई } (h) = \sqrt{a^2 - \frac{b^2}{4}} = \sqrt{\frac{4a^2 - b^2}{4}} = \frac{1}{2} \times \sqrt{4a^2 - b^2}$$

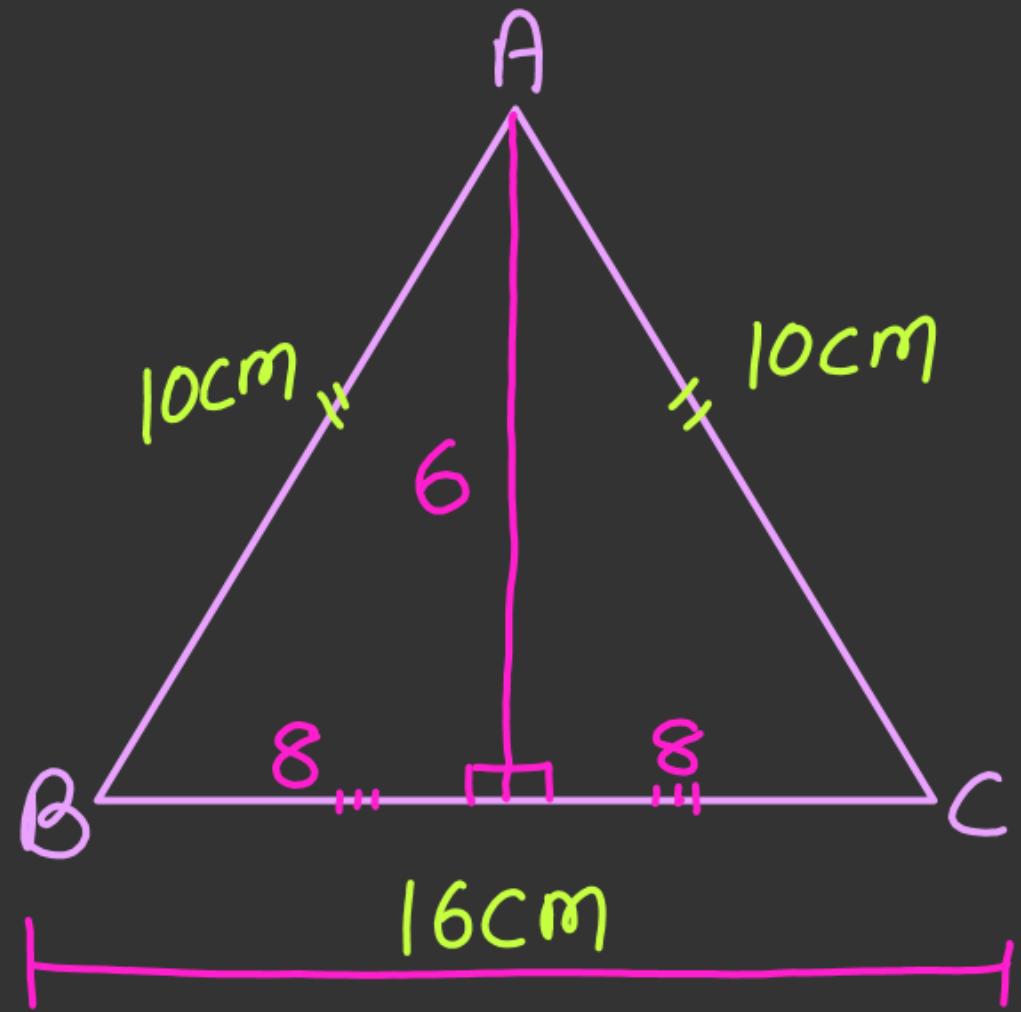
$$\textcircled{iii} \text{ Area } (\text{क्षेत्र}) = \frac{1}{2} \times b \times \frac{1}{2} \times \sqrt{4a^2 - b^2} = \frac{b}{4} \times \sqrt{4a^2 - b^2}$$

AD → (ऊँचाई | माध्यिका | कोण समांतराल | भूमध्यसमांतराल)



$$\begin{aligned}
 &= \sqrt{18 \times 8 \times 8 \times 2} \\
 &= 6 \times 8 \\
 &= 48 \text{ cm}^2
 \end{aligned}$$

$$\begin{aligned}
 \text{Area} &= \frac{b}{4} \sqrt{4a^2 - b^2} \\
 &= \frac{16}{4} \sqrt{4 \times 10^2 - 16^2} \\
 &= 4 \times \sqrt{400 - 256} \\
 &= 4 \times \sqrt{144} \\
 &= 4 \times 12 \\
 &= 48 \text{ cm}^2
 \end{aligned}$$



$$\text{Area} = \frac{1}{2} \times 16 \times 6^2$$

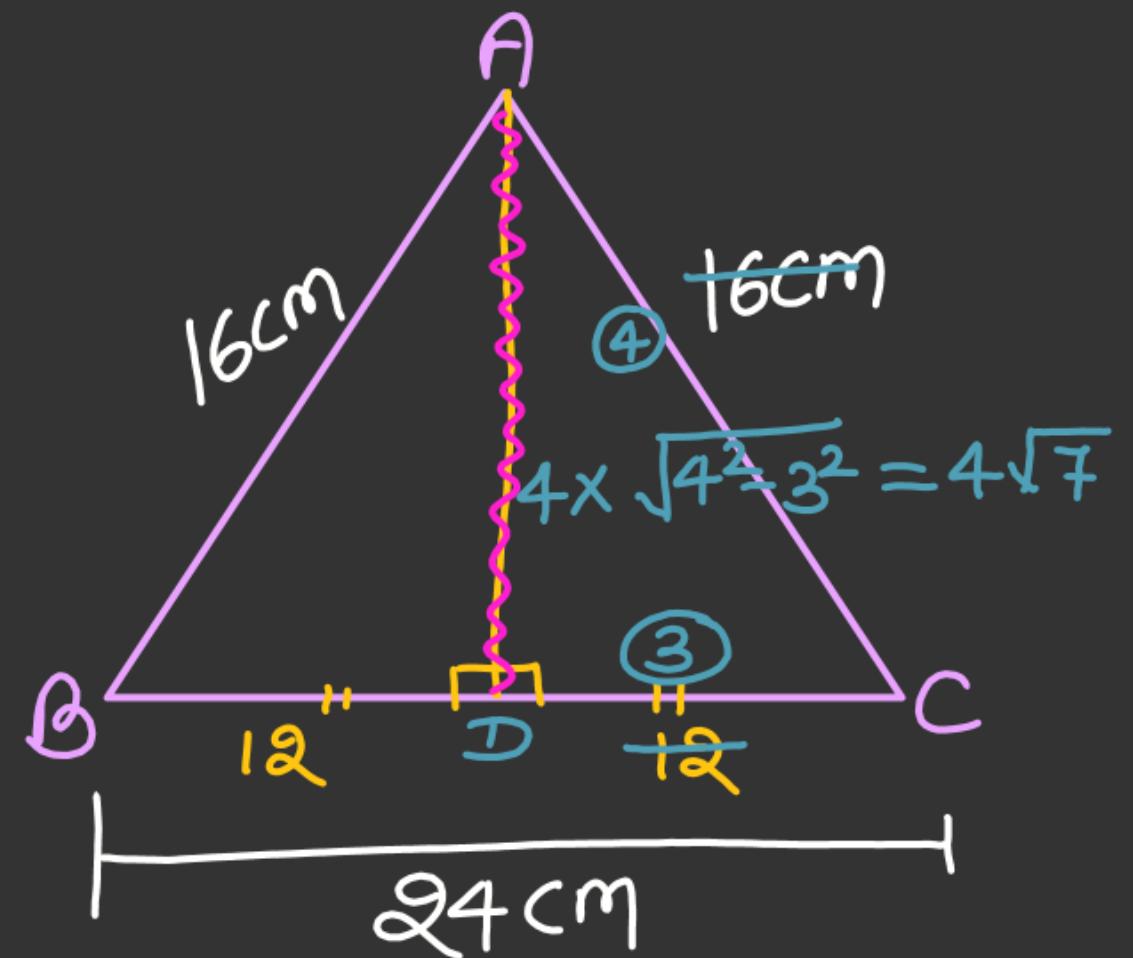
$$= 48 \text{ cm}^2$$

$$AD = \sqrt{16^2 - 12^2}$$

$$= \sqrt{256 - 144}$$

$$= \sqrt{112} = \sqrt{16 \times 7}$$

$$= 4\sqrt{7}$$

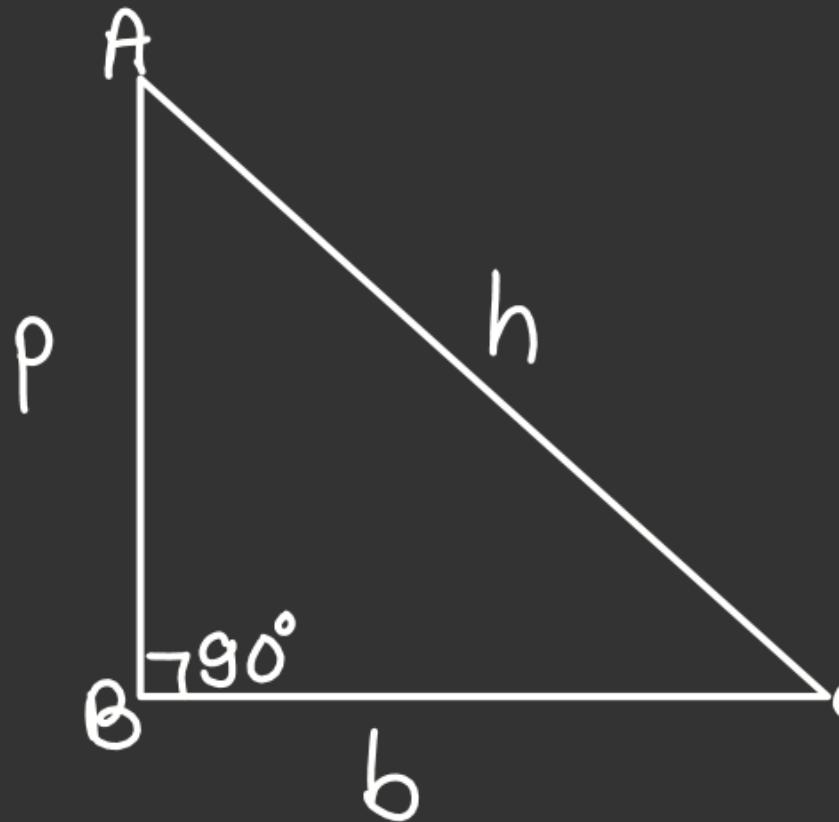


$$\text{Area} = \frac{1}{2} \times 24 \times 4\sqrt{7}$$

$$= 48\sqrt{7} \text{ cm}^2$$

Right Angled Triangle

→ समकोण त्रिकोण



$$i) p^2 + b^2 = h^2$$

$$ii) \text{perimeter} = p+b+h$$

$$iii) \delta = \frac{p+b-h}{2}$$

$$iv) R = \frac{h}{2}$$

$$v) \Delta \text{Area} = \frac{1}{2} \times b \times p$$

$$\gamma = \frac{\Delta}{S}$$

Δ = γ · S

त्रिमकाण्डका क्षेत्रफल

$$\text{Area} = \frac{1}{2} \times b \times p = \gamma \cdot S = S(S-2R) = S(S-2M) = S(S-H) = \gamma(\gamma + 2R)$$

$$\gamma = \frac{p+b-h}{2} = \frac{p+b+h-2h}{2} = \frac{p+b+h}{2} - \frac{2h}{2}$$

$$= S-h$$

$$\boxed{\gamma = S-2R}$$

$$\gamma + 2R = S$$

$$\begin{aligned} &\gamma \cdot S \\ &\gamma(\gamma + 2R) \end{aligned}$$

$$R = \frac{H}{2}$$

H = 2R

~~log A · P, उपर्युक्त HP~~