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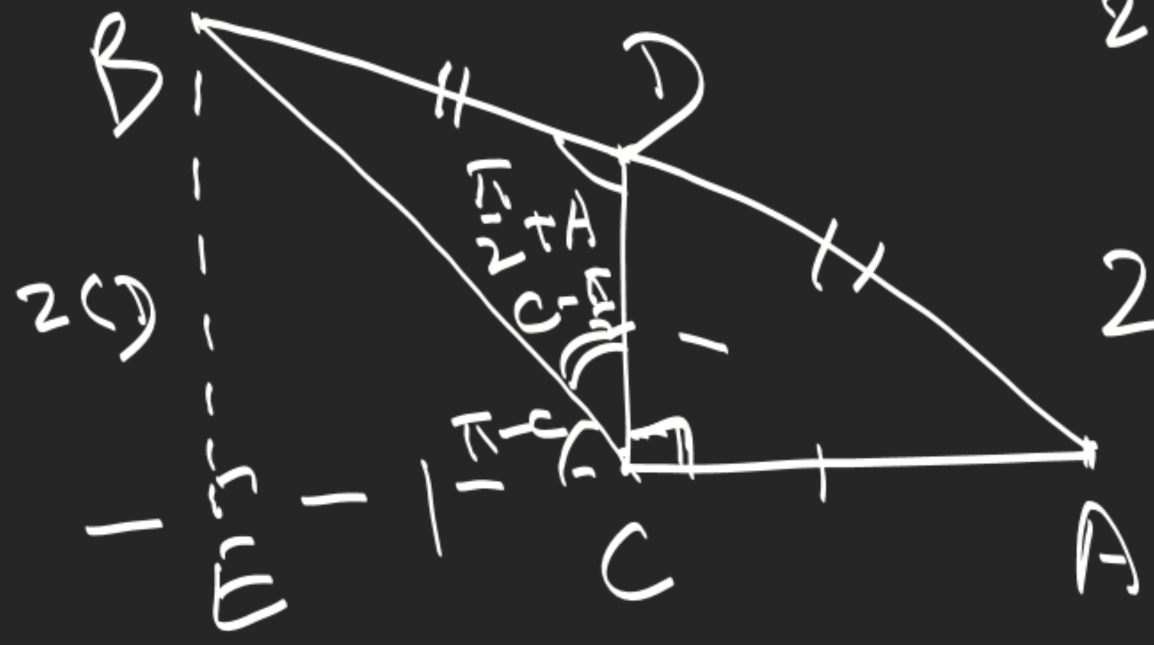

$2\tan A + \tan C = 0$

$\boxed{10\text{ am}}$

$\downarrow$

S.L. Loney

$2\tan A = \frac{2CD}{AC}$

$\tan(\pi - C) = \frac{2CD}{AC} = -\tan C$

$(1+1)\cot\left(\frac{\pi}{2}+A\right) = 1\cot\frac{\pi}{2} - 1\cot\left(C-\frac{\pi}{2}\right)$

$-2\tan A = 0 + \tan C$

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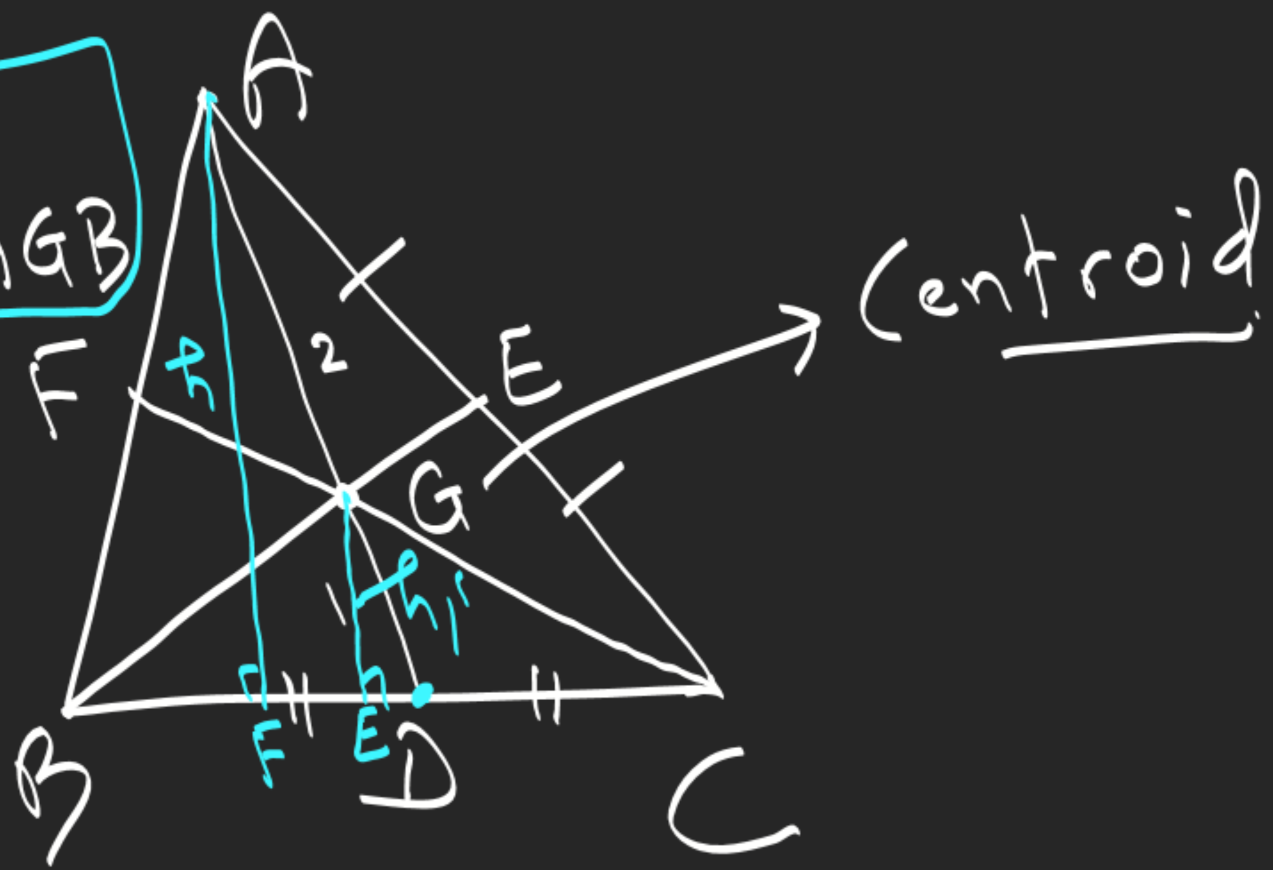
Median

$$\boxed{\Delta BGC = \Delta CGA = \Delta AGB = \frac{1}{3}\Delta ABC}$$



$$\frac{\Delta BGC}{\Delta ABC} = \frac{h_1}{h} = \frac{GD}{AD} = \frac{1}{3}$$

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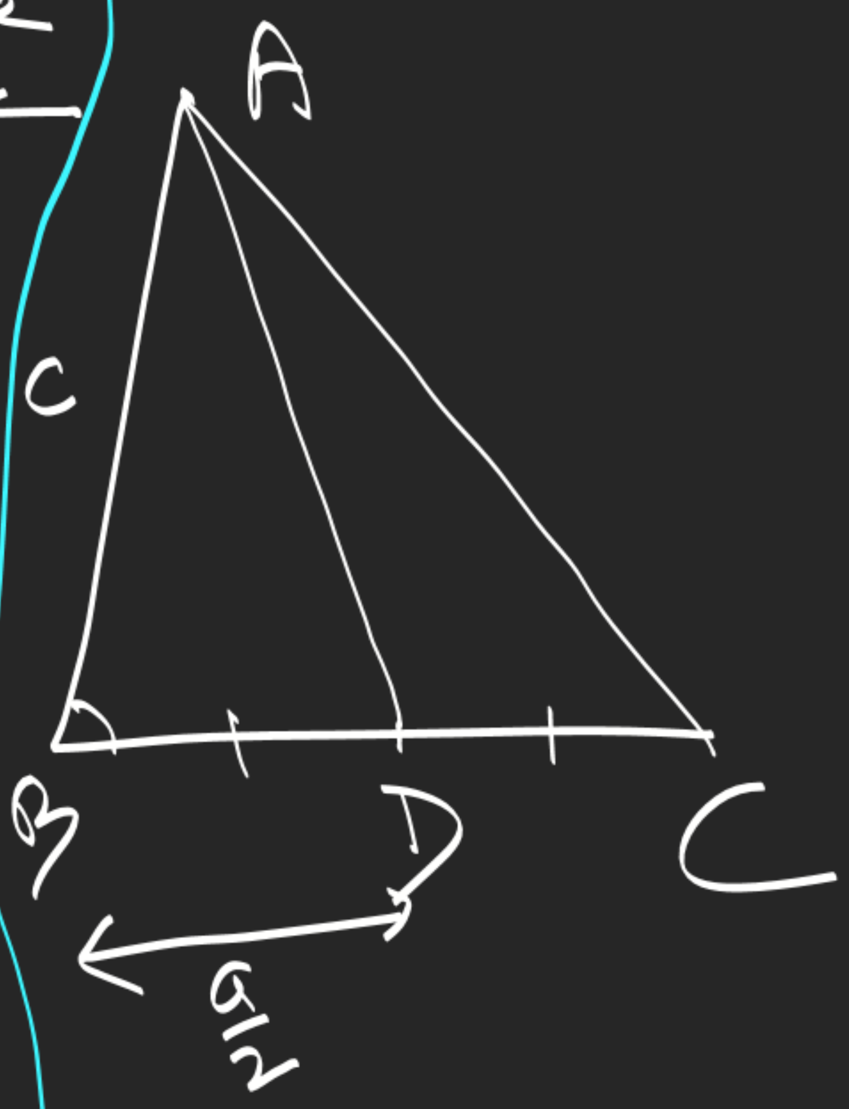
$$l_C^2 = \frac{2(a^2+b^2)-c^2}{4}$$

$$l_B^2 = \frac{2(c^2+a^2)-b^2}{4}$$

$$\boxed{l_A^2 = AD^2 = \frac{2(c^2+b^2)-a^2}{4}}$$

$\Downarrow$

Appolonius theorem



AD

ΔADB

$$\cos B = \frac{c^2+\left(\frac{a}{2}\right)^2 - AD^2}{2(c)\left(\frac{a}{2}\right)} = \frac{c^2+a^2-b^2}{2ca}$$

$$2\left(c^2+\frac{a^2}{4}-AD^2\right) = c^2+a^2-b^2$$

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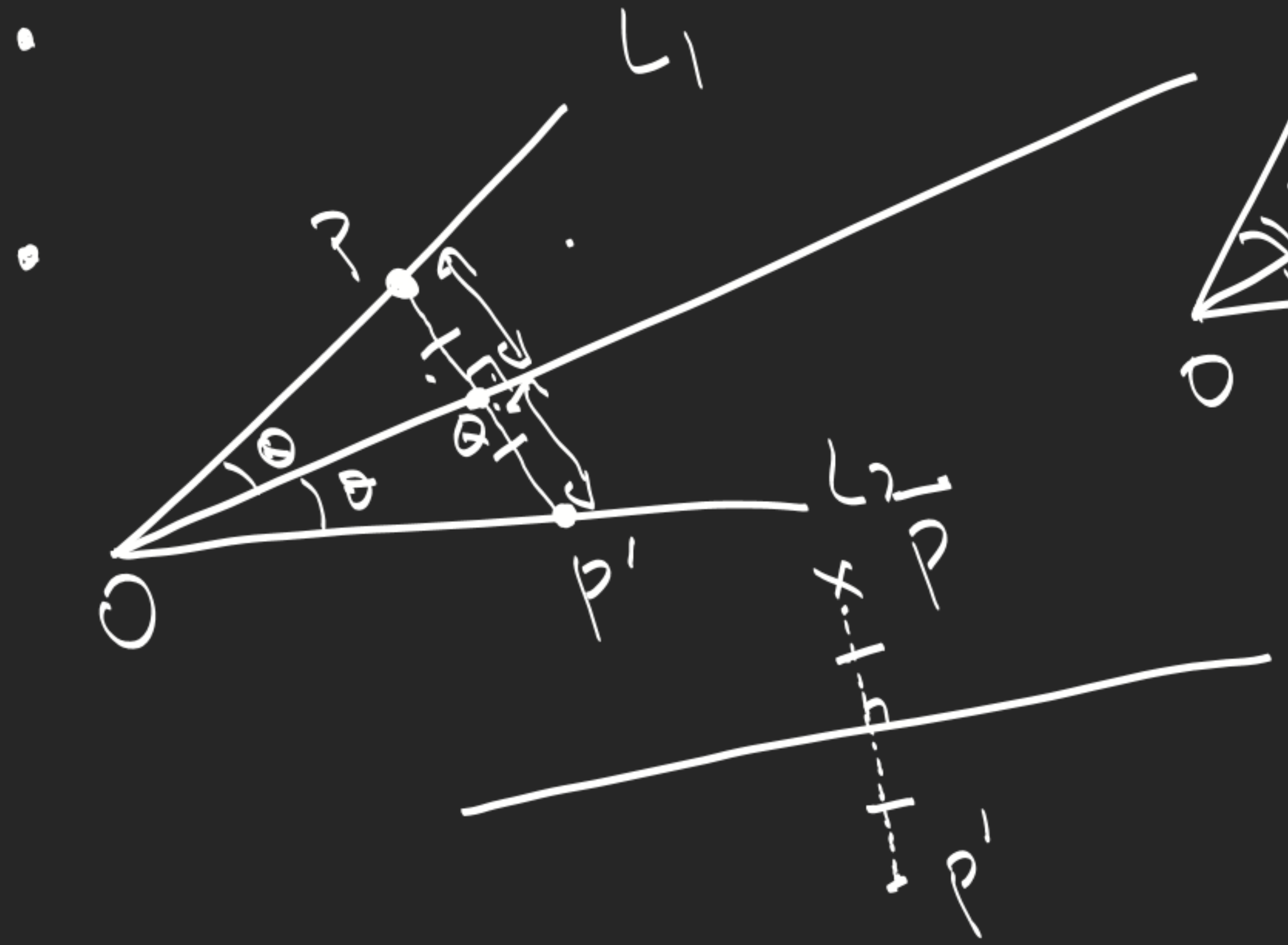
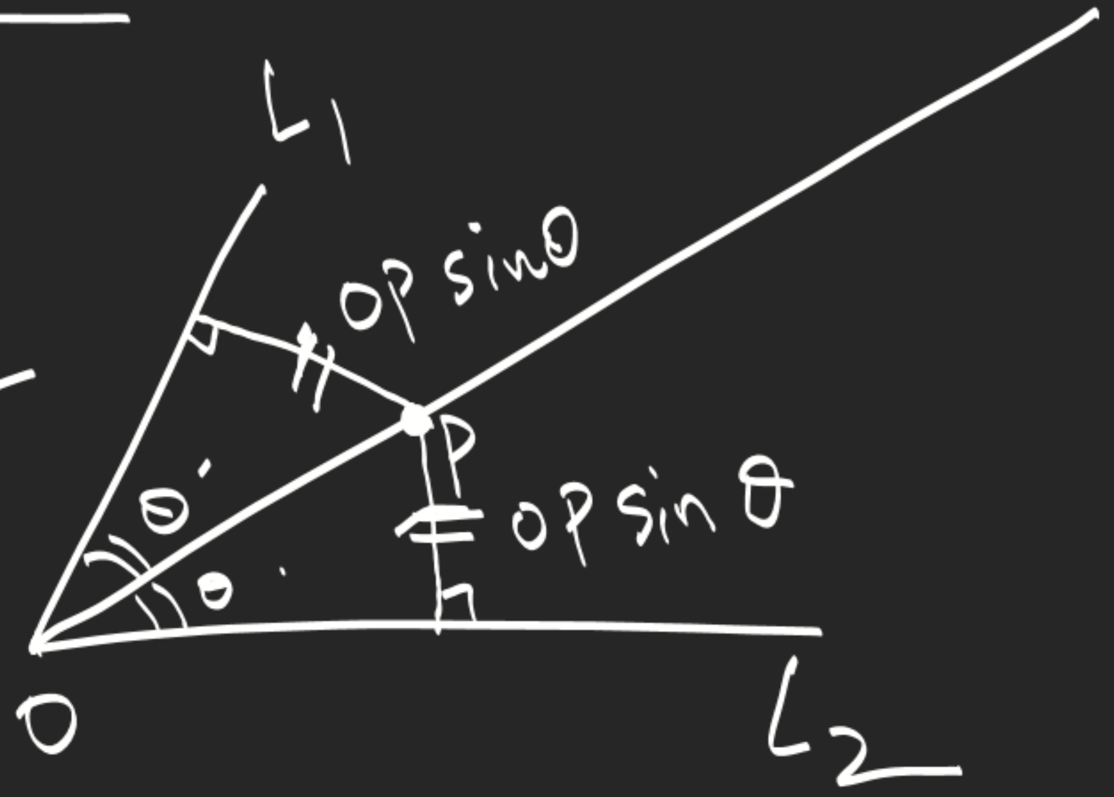
Angle Bisector





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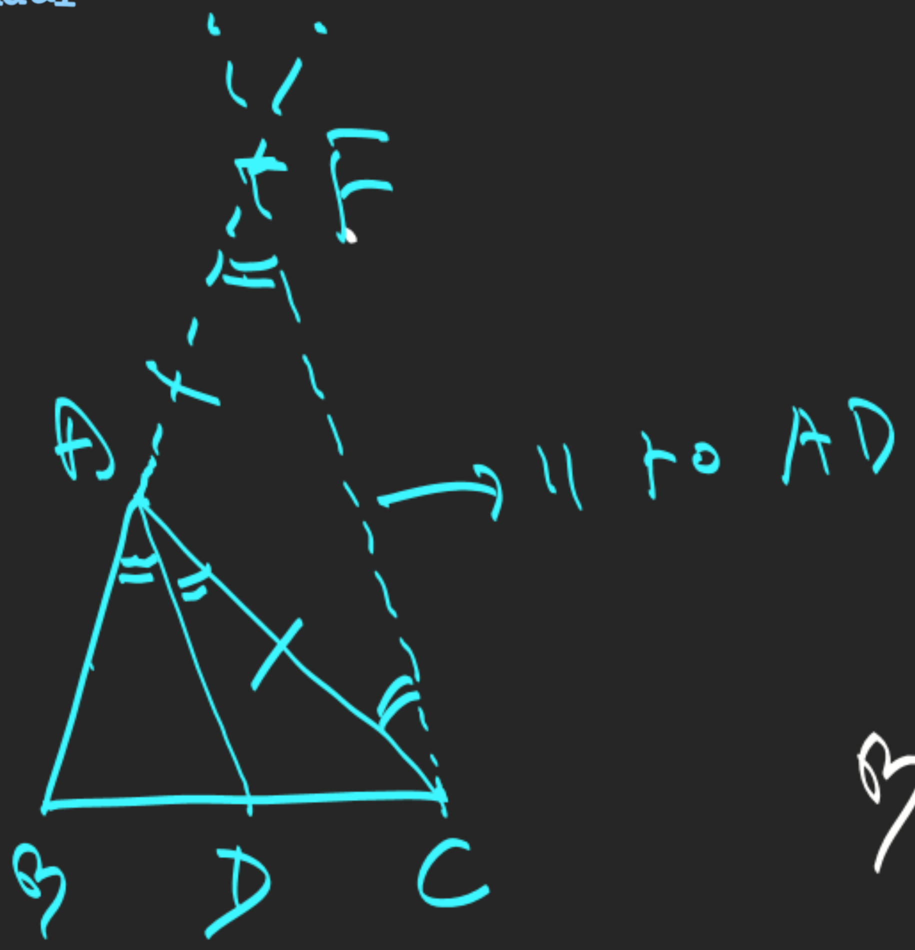

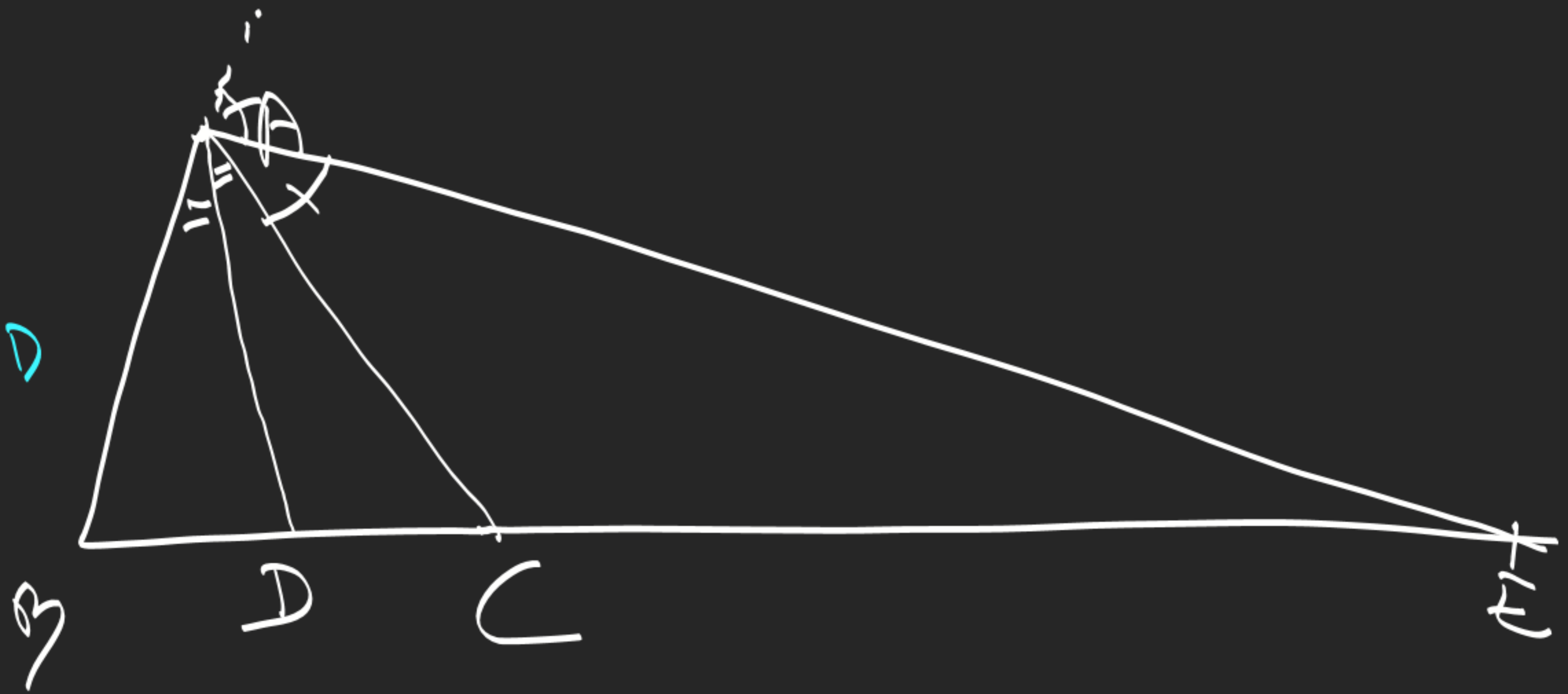

(internally) $\frac{BD}{DC} = \frac{AB}{AC} = \frac{BE}{CE}$ (externally)

$$\frac{AB}{AF} = \frac{BD}{DC} = \frac{AB}{AC}$$