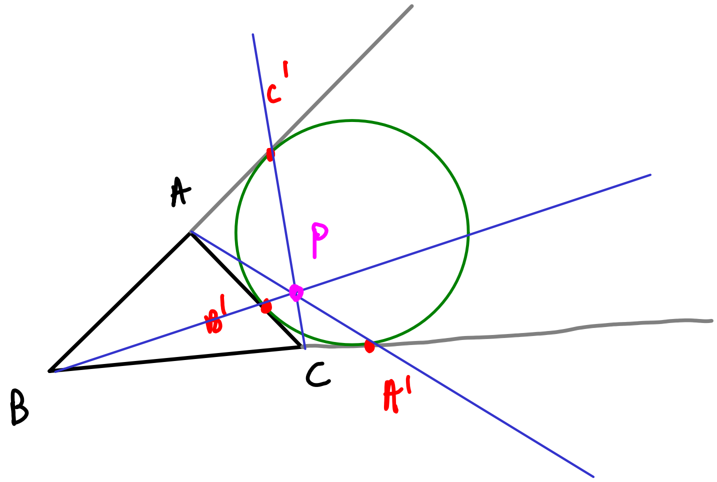


Properties of tan's to cir.

$\overline{BA'} = \overline{C'B}$

$\overline{B'A} = \overline{C'A}$

$\overline{CA'} = \overline{CB'}$

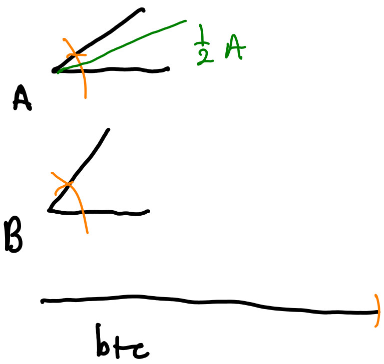
Prove: $\overline{AA'}, \overline{BB'}, \overline{CC'}$ are concurrent.

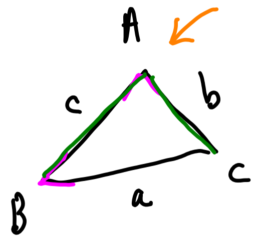
Consider:

$$\frac{\overline{BA'}}{\overline{A'C}} \cdot \frac{\overline{CB'}}{\overline{B'A}} \cdot \frac{\overline{AC'}}{\overline{C'B}} = \overset{1}{\boxed{\frac{\overline{BA'}}{\overline{C'B}}}} \cdot \overset{-1}{\boxed{\frac{\overline{CB'}}{\overline{A'C}}}} \cdot \overset{-1}{\boxed{\frac{\overline{AC'}}{\overline{B'A}}}} = 1$$

Then, by Ceva's Thm, the lines must be concurrent.

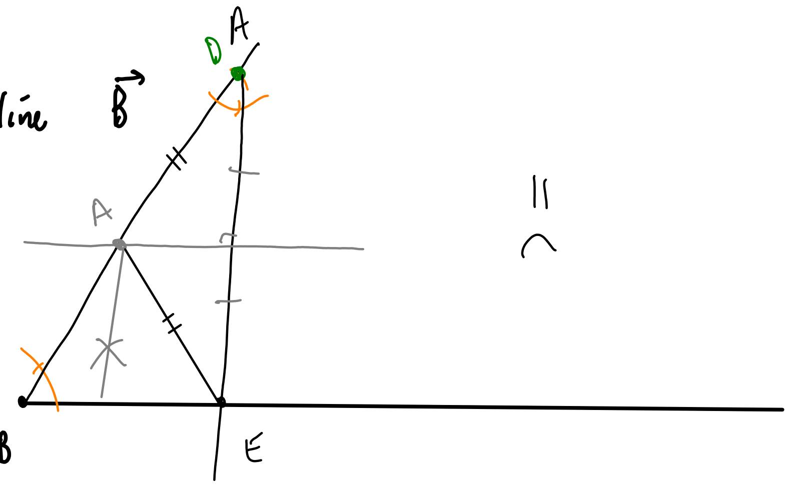
Given.





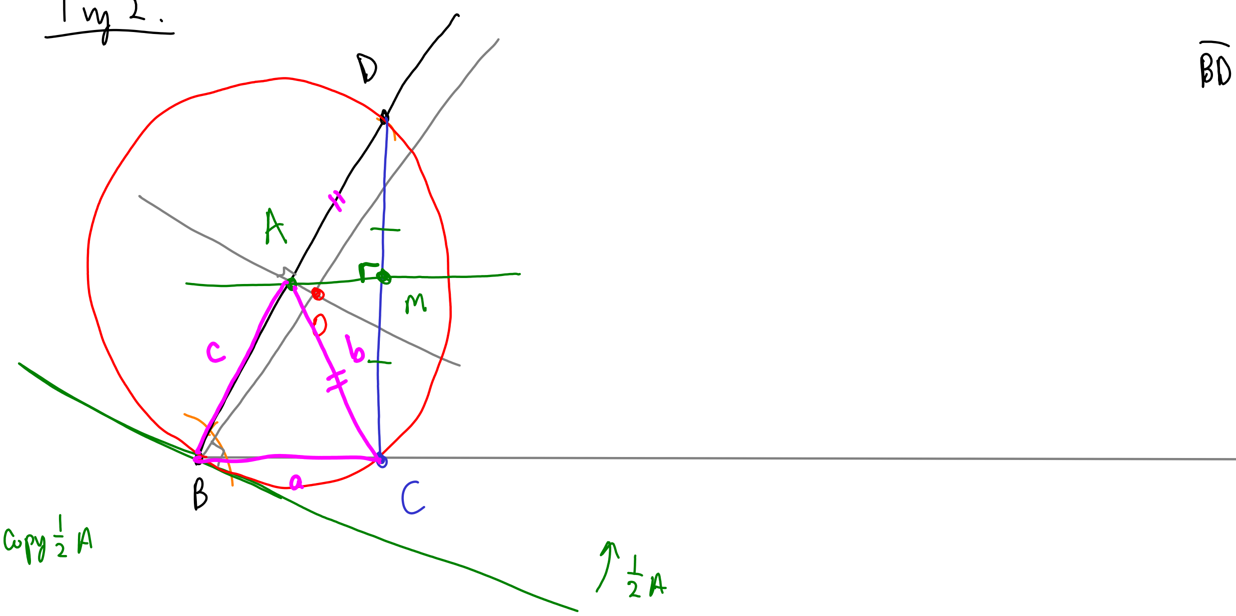
Start w/ line $\overrightarrow{B}$

$\overline{BD} = b+c$

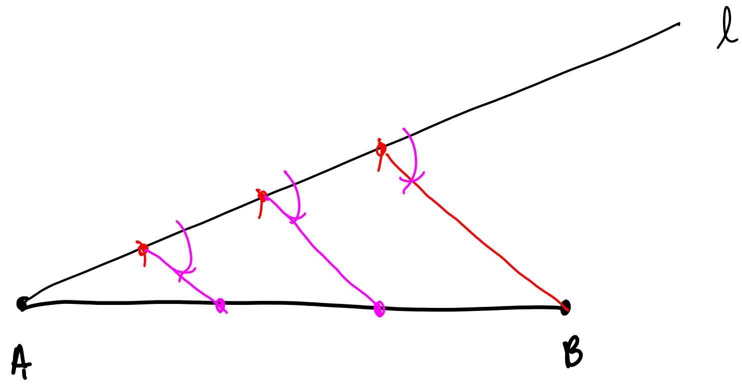


Try 2.

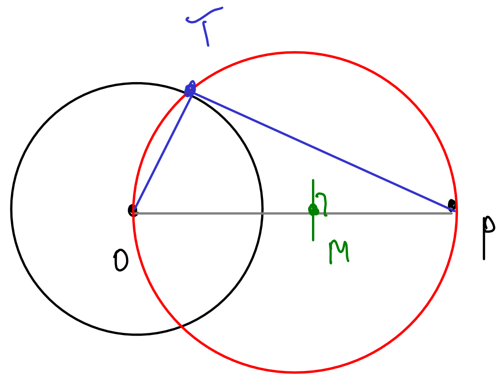
$\overline{BD} = b+c$



copy $\frac{1}{2}A$



ℓ
A
B


T
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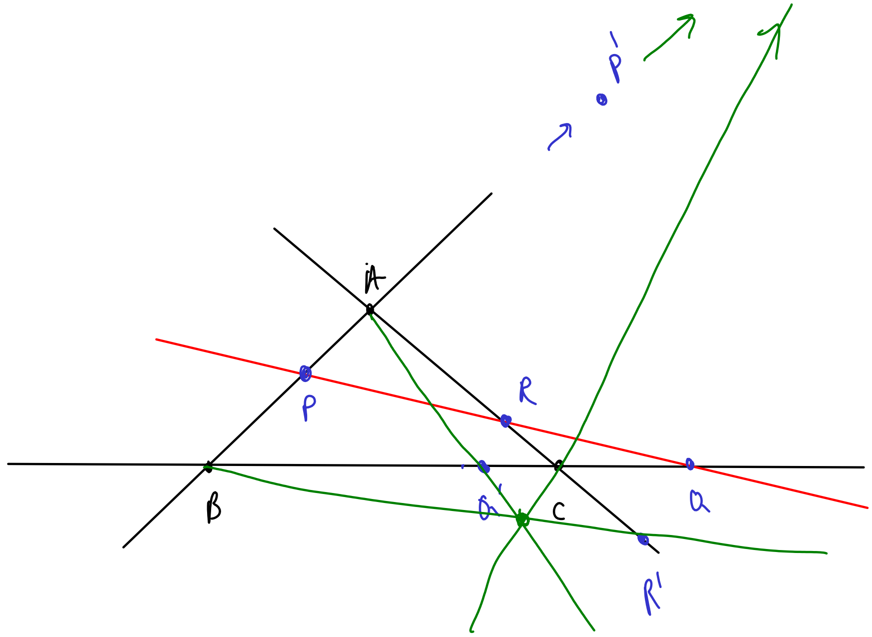
2.8.



$$\left\{\begin{array}{l} \boxed{(BA, PP') = -1} \\ (AC, RR') = -1 \\ (BC, Q'Q) = -1 \end{array}\right.$$

Harmonic:

$$\frac{\overline{BP}}{\overline{PA}} \cdot \frac{\overline{P'A}}{\overline{BP'}} = -1 \quad \text{or}$$

$$\frac{\overline{BP}}{\overline{PA}} = \frac{-\overline{BP'}}{\overline{P'A}}$$

Menelaus:

$$\frac{\overline{AP}}{\overline{PB}} \cdot \frac{\overline{BQ}}{\overline{QC}} \cdot \frac{\overline{CR}}{\overline{RA}} = -1$$

Plug and chug to replace P, Q, R by P', Q', R'.

Get Ceva's Thm.