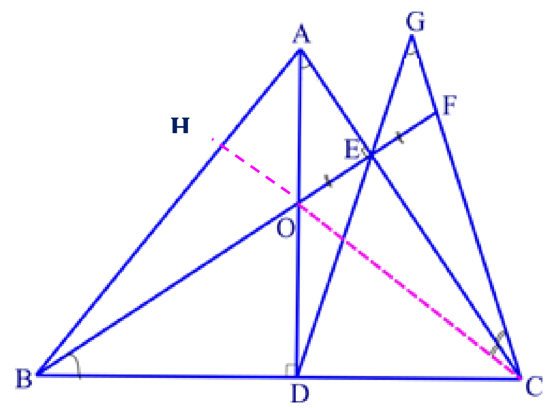
I CASH PRIZE WINNER Master.H.Karthikeya's SOLUTION



Given:

OE=EF, $\angle D=90^0=\angle E$

T.P :

$\frac{BC}{GC} = \frac{FC}{DC}$

Construction:

Draw CH perpendicular to AB.

Proof:

In Δ AOE & ΔBOD,

$\angle AOE = \angle BOD$ (Vertically Opposite Angles)

$\angle OED = \angle BDO = 90^0$

$\Delta AOE \sim \Delta BOD$ (AA Similarity)

So, $\angle A = \angle B$ -------(1)

In Δ CEO & ΔCEF,

$\angle E = \angle E = 90^0$

CE=CE (Common side)

OE=EF (Given)

Δ CEO $\cong \Delta CEF$ (SAS similarity)

So, $\angle OCE = \angle FCE$ ----- (2)

In ODCE quadrilateral,

As $\angle D + \angle E = 90^0+90^0=180^0$

This is a cyclic quadrilateral.

So, $\angle ECO = \angle EDO$ $(Same\ segment\ angles)$ --------- (3)

In ΔADE & ΔACO,

$\angle AED = \angle AOC$ ----- (4)

$\angle AED = \angle GEC$ (Vertically opposite angles)

$\angle AOC = \angle GEC$ ------(5)

In ΔAOC & ΔGEC

As ∠AOC = ∠GEC

$\angle OCA = \angle ECG$

ΔAOC ~ ΔGEC (AA similarity)

$\angle A = \angle G$

Hence, $\angle B = \angle G$

In ΔBCF & ΔGCD

$\angle B = \angle G$

$\angle C = \angle C$

ΔBCF ~ ΔGCD (AA similarity)

$\Rightarrow \frac{BC}{GC} = \frac{FC}{DC}$ ----- Hence proved.