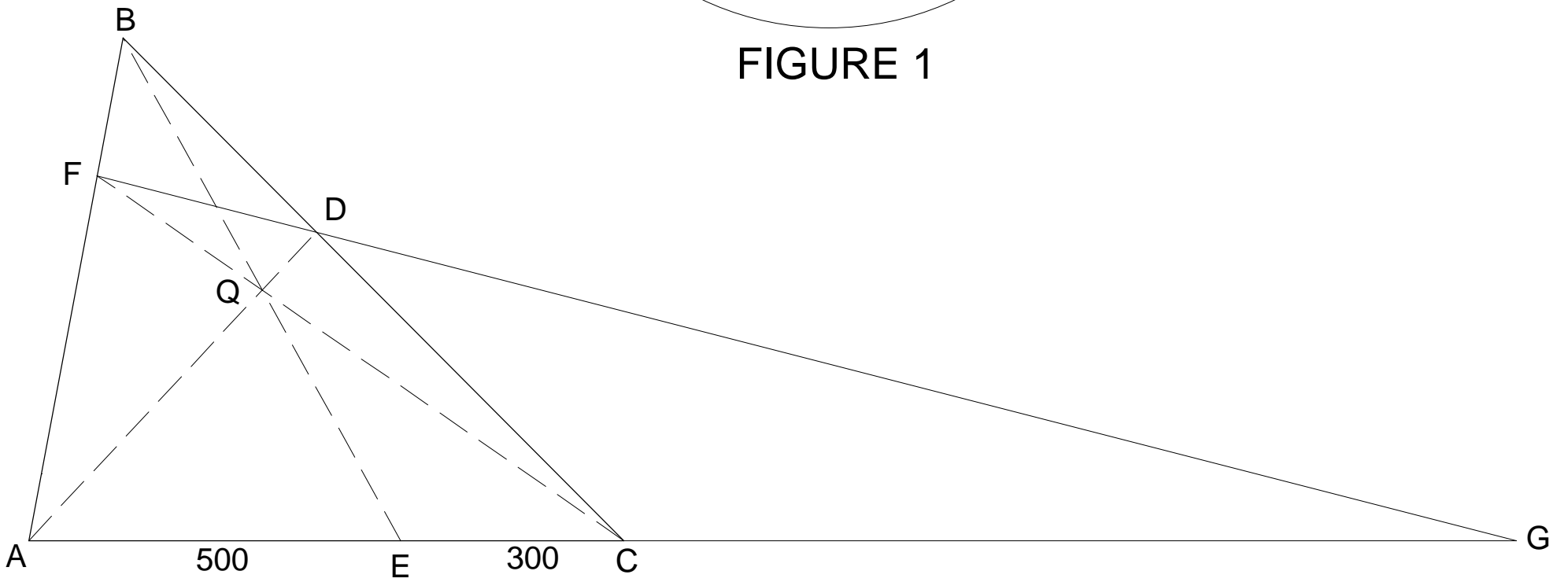


FIGURE 1



First, in Figure 1, P is a point on the circle Q with diameter XY.

X, W, Y and Z are collinear. PZ is tangent to the circle.

Angle PXY = angle QPX = angle YPZ, because angle APZ = 90° + angle XPQ and both angle APY and angle WPZ = 90°.

$\overline{PQ}^2 = \overline{XQ}^2 + \overline{YQ}^2$ or $\overline{PQ}^2 = XQ \cdot YQ$ and circle Q is an Apollonius Circle with $\frac{PW}{PZ}$ a

constant, so $\frac{XW}{XZ} = \frac{WY}{YZ}$. Point W always divides XY internally in the same proportion

as point Z divides XZ externally. Points W and Z are said to be harmonic conjugates of points X and Y.

Returning to the problem and applying our notation to the four collinear points,

$$\frac{AE}{EG} = \frac{EC}{CG}$$

$$CG = \frac{EC \cdot AG}{AE} = \frac{300(800 + CG)}{500}$$

$$500 \cdot CG = 240,000 + 300 \cdot CG$$

$$200 \cdot CG = 240,000$$

$$CG = 1,200$$