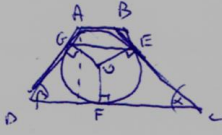


3.57
 $\frac{p}{4} \cdot \frac{1}{2}$



אם α ו- β הן זוויות $\angle A$ ו- $\angle B$ של $\triangle ABC$ אז $\angle C = 180 - \alpha - \beta$

$$AD = \frac{2R}{\sin \beta}, \quad BC = \frac{2R}{\sin \alpha}$$

$$AB + CD = AD + BC = 2R \left(\frac{1}{\sin \beta} + \frac{1}{\sin \alpha} \right) \text{ שווה ל-} 2R \left(\frac{\sin \alpha + \sin \beta}{\sin \alpha \sin \beta} \right)$$

$$P = AB + BC + CD + DA = 2 \cdot 2R \left(\frac{1}{\sin \alpha} + \frac{1}{\sin \beta} \right) = 4R \left(\frac{\sin \alpha + \sin \beta}{\sin \alpha \sin \beta} \right)$$

$$R = \frac{p \sin \alpha \sin \beta}{4(\sin \alpha + \sin \beta)} = \frac{p \sin \alpha \sin \beta}{8 \sin \frac{\alpha + \beta}{2} \cos \frac{\alpha - \beta}{2}}$$

$$\begin{aligned} \angle GOE &= 360 - (180 - \alpha) - (180 - \beta) && \angle EOF = 180 - \alpha && \angle ECF && \text{זווית } \angle C \\ &= \alpha + \beta && \angle GOF = 180 - \beta && \angle OFD && \text{"} \end{aligned}$$

$\triangle GEF$ משולש שווה שוקים

$$\begin{aligned} GE^2 &= GO^2 + OE^2 - 2GO \cdot OE \cdot \cos(\alpha + \beta) = \\ &= 2R^2 - 2R^2 \cos(\alpha + \beta) = 2R^2 (1 - \cos(\alpha + \beta)) = \frac{p^2 \sin^2 \alpha \sin^2 \beta}{32 \sin^2 \frac{\alpha + \beta}{2} \cos^2 \frac{\alpha - \beta}{2}} (1 - \cos(\alpha + \beta)) \\ &= \frac{p^2 \sin^2 \alpha \sin^2 \beta}{32 \sin^2 \frac{\alpha + \beta}{2} \cos^2 \frac{\alpha - \beta}{2}} \cdot 2 \sin^2 \frac{\alpha + \beta}{2} = \frac{p^2 \sin^2 \alpha \sin^2 \beta}{16 \cos^2 \frac{\alpha - \beta}{2}} \end{aligned}$$

$$GE = \frac{p \sin \alpha \sin \beta}{4 \cos \frac{\alpha - \beta}{2}}$$