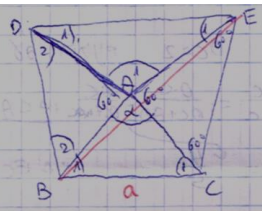
2.55
6



$\angle C_1 = \angle B_1 = 90 - \frac{\alpha}{2}$

$\angle A_1 = 240 - \alpha$

$\angle E_1 = \angle D_1 = \frac{\alpha}{2} - 30$

$\angle D + \angle B = \angle D_1 + \angle D_2 + \angle B_2 + \angle B_1 = \frac{\alpha}{2} - 30 + 60 + 60 + 90 - \frac{\alpha}{2} = 180°$

(180° ,מתוך משולש שווה צלעות) $DE \parallel BC$ ⇐

.כיוון שווה DE=CB ← DB=EC

$AB = \frac{a \sin\frac{\alpha}{2}}{\sin\alpha} = \frac{a}{2\sin\frac{\alpha}{2}}$ ⇐ $\frac{AB}{\sin\alpha} = \frac{AB}{\sin(90-\frac{\alpha}{2})}$: $\triangle ABC$ (ג)

$BE^2 = AB^2 + AE^2 - 2AB \cdot AE \cdot \cos(\alpha+60) = \frac{a^2}{4\sin^2\frac{\alpha}{2}} + \frac{a^2}{4\sin^2\frac{\alpha}{2}} - \frac{2a^2\cos(\alpha+60)}{4\sin^2\frac{\alpha}{2}}$: $\triangle ABE$

$BE = \frac{a}{2\sin\frac{\alpha}{2}}\sqrt{2-2\cos(\alpha+60)} = \frac{a}{2\sin\frac{\alpha}{2}}\sqrt{2(1-\cos(\alpha+60))} = \frac{a}{2\sin\frac{\alpha}{2}}\sqrt{2\cdot 2\sin^2(\frac{\alpha}{2}+30)} = \frac{a\sin(\frac{\alpha}{2}+30)}{\sin\frac{\alpha}{2}}$

$\frac{AD}{\sin(\frac{\alpha}{2}-30)} \overset{=AB}{=} \frac{DE}{\sin(240-\alpha)} \rightarrow DE = \frac{a\sin(\alpha-60)}{2\sin\frac{\alpha}{2}\cdot\sin(\frac{\alpha}{2}-30)} = \frac{2a\cos(\frac{\alpha}{2}-30)}{2\sin\frac{\alpha}{2}}$: $\triangle ADE$

$= \frac{a\sin(90-\frac{\alpha}{2}+30)}{\sin\frac{\alpha}{2}} = \frac{a\sin(60+\frac{\alpha}{2})}{\sin\frac{\alpha}{2}}$

(ד) $BE = DE \rightarrow \frac{a\sin(60+\frac{\alpha}{2})}{\sin\frac{\alpha}{2}} = \frac{a\sin(\frac{\alpha}{2}+30)}{\sin\frac{\alpha}{2}}$

$60+\frac{\alpha}{2} = \frac{\alpha}{2}+30$ $\qquad$ $60+\frac{\alpha}{2} = 180-(\frac{\alpha}{2}+30)$

לא פתרון $\qquad$ $\alpha = 90$