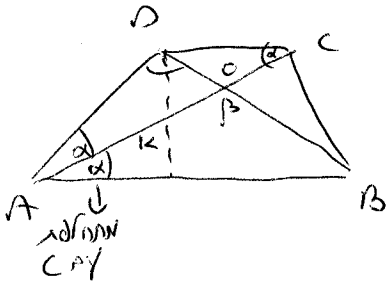
9.



$KD_1 = 180-\alpha-(180-\beta) = \beta-\alpha$: $\triangle ADO$

$$\frac{k}{\sin(\beta-\alpha)} = \frac{AD}{\sin(180-\beta)}$$

$$AD = \frac{k\sin(180-\beta)}{\sin(\beta-\alpha)} = \frac{k\sin\beta}{\sin(\beta-\alpha)}$$

(כי $AD = DC$)

$\triangle ADB$:

$$\frac{AB}{\sin(\beta-\alpha)} = \frac{AD}{\sin(180-(\beta-\alpha)-2\alpha)}$$

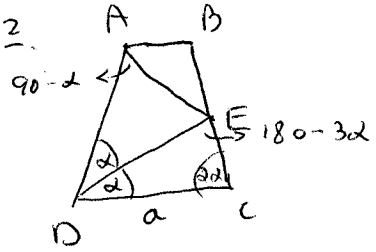
$$AB = \frac{k\sin\beta}{\sin(\beta-\alpha)} \cdot \frac{\sin(\beta-\alpha)}{\sin(180-\beta-\alpha)} = \frac{k\sin\beנ}{\sin(\alpha+\beta)}$$

גובה שווה

$$\frac{h}{AD} = \sin 2\alpha \rightarrow h = \frac{k\sin\beta\cdot\sin 2\alpha}{\sin(\beta-\alpha)}$$

$$S_{ABCD} = \frac{h(AB+DC)}{2} = \frac{k\sin\beta\sin 2\alpha}{2\sin(\beta-\alpha)}\left[\frac{k\sin\beta}{\sin(\beta+\alpha)} + \frac{k\sin\beta}{\sin(\beta-\alpha)}\right]$$

2.



$\triangle DEC$:

$$\frac{DC}{\sin(180-3\alpha)} = \frac{DE}{\sin 2\alpha}$$

$$DE = \frac{a\sin 2\alpha}{\sin 3\alpha}$$

$\triangle AED$: $\angle AED = 90^\circ$ (נתון נוסף)

$$\frac{AE}{DE} = \tan\alpha$$

$$AE = \frac{a\sin 2\alpha\tan\alpha}{\sin 3\alpha}$$

$\triangle ABE$

$$\frac{AB}{\sin(3\alpha-90)} = \frac{AE}{\sin(180-2\alpha)}$$

$$AB = \frac{a\sin 2\alpha\tan\alpha\sin(3\alpha-90)}{\sin 3\alpha\sin 2\alpha} = \frac{a\tan\alpha\sin(3\alpha-90)}{\sin 3\alpha}$$