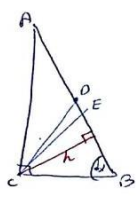


2.69
6



נתון: $\triangle ABC$ ישרי זווית, $\angle B = \alpha$. $DE \parallel AB$. K נמצא על CE כך ש- $\angle CAK = \alpha$.

$$\frac{S_{COE}}{S_{ABC}} = \frac{\frac{OE \cdot h}{2}}{\frac{AB \cdot h}{2}} = \frac{OE}{AB}$$

נניח $AB = 2x$
 $AC = 2x \sin \alpha$
 $BC = 2x \cos \alpha$

$$\frac{AC}{BC} = \frac{AE}{EB}$$

$$\frac{2x \sin \alpha}{2x \cos \alpha} = \frac{AE}{EB}$$

$$\tan \alpha = \frac{AE}{EB} \rightarrow AE = EB \tan \alpha$$

$$AB = AE + EB \rightarrow 2x = EB \tan \alpha + EB = EB(1 + \tan \alpha)$$

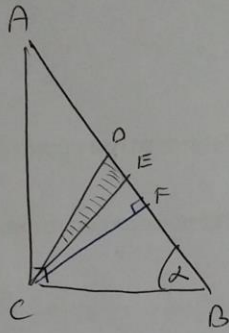
$$EB = \frac{2x}{1 + \tan \alpha}$$

$$DE = DB - EB = x - \frac{2x}{1 + \tan \alpha} = \frac{x \tan \alpha - x}{1 + \tan \alpha} = \frac{x(\tan \alpha - 1)}{1 + \tan \alpha}$$

$$\frac{DE}{AB} = \frac{\frac{x(\tan \alpha - 1)}{1 + \tan \alpha}}{2x} = \frac{\tan \alpha - 1}{2(1 + \tan \alpha)} = \frac{1}{2} \cdot \frac{\tan \alpha - \tan 45^\circ}{1 + \tan \alpha \cdot \tan 45^\circ} = \frac{1}{2} (\tan(\alpha - 45^\circ))$$

דרך נוספת

2.69
6



2x - פ (הקטן יותר) (הגדול יותר)
 $AC = 2x \sin \alpha$
 $BC = 2x \cos \alpha$

$$S_{ABC} = \frac{AC \cdot BC}{2} = 2x^2 \sin \alpha \cos \alpha$$

(CF) נ"פ C! (כל צ"ל)

$$\frac{CF}{CB} = \sin \alpha$$

$$CF = 2x \cos \alpha \sin \alpha$$

$$\frac{FB}{CB} = \cos \alpha \rightarrow FB = 2x \cos^2 \alpha$$

$$\frac{AC}{BC} = \frac{AE}{BE}$$

$$\frac{2x \sin \alpha}{2x \cos \alpha} = \frac{AE}{BE}$$

$$AE = BE \tan \alpha$$

$$AB = AE + BE = BE \tan \alpha + BE = BE(1 + \tan \alpha)$$

$$BE = \frac{AB}{1 + \tan \alpha} = \frac{2x}{1 + \tan \alpha} \rightarrow AE = \frac{2x \tan \alpha}{1 + \tan \alpha}$$

$$ED = AE - AD = \frac{2x \tan \alpha}{1 + \tan \alpha} - \frac{1}{2} AB = \frac{2x \tan \alpha}{1 + \tan \alpha} - \frac{2x}{2} = 2x \left(\frac{\tan \alpha}{1 + \tan \alpha} - \frac{1}{2} \right)$$

$$S_{CEF} = \frac{ED \cdot CF}{2} = \frac{2x \left(\frac{\tan \alpha - 1}{2(1 + \tan \alpha)} \right) \cdot 2x \sin \alpha \cos \alpha}{2} = 2x^2 \left(\frac{\tan \alpha - 1}{2(1 + \tan \alpha)} \right)$$

$$\frac{S_{CEF}}{S_{ABC}} = \frac{2x^2 \sin \alpha \cos \alpha \left(\frac{\tan \alpha - 1}{2(1 + \tan \alpha)} \right)}{2x^2 \sin \alpha \cos \alpha} = \frac{1}{2} \cdot \frac{\tan \alpha - \tan 45^\circ}{1 + \tan \alpha \tan 45^\circ} = \frac{1}{2} \tan(\alpha - 45^\circ)$$

ΔABC ? ה"שית ? צ"ל ? צ"ל ? צ"ל ?