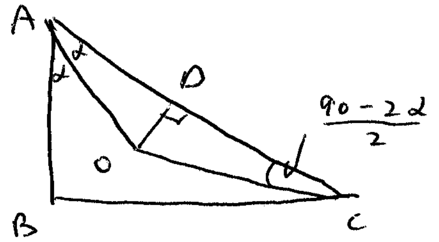
.11



א. $\triangle AOC$: $\frac{AC}{\sin(180-\alpha-\frac{90-2\alpha}{2})} = \frac{AO}{\sin(\frac{90-2\alpha}{2})}$

$$AO = \frac{\sin(45-\alpha)}{\sin 135} \cdot b$$

$\triangle AOD$: $\frac{DO}{AO} = \sin\alpha \rightarrow DO = \frac{\sin\alpha \sin(45-\alpha)}{\sin 135} b$

$$\frac{1}{5}b = \frac{b\sin\alpha\sin(45-\alpha)}{\sin 135} \quad /:b$$

ב.

$$\frac{\sqrt{2}}{10} = \sin\alpha\sin(45-\alpha) = \frac{1}{2}\left(\cos(2\alpha-45)-\cos 45\right) =$$

המרת מכפלה $\sin\cdot\sin$

$$\frac{\sqrt{2}}{10} = \frac{1}{2}\cos(2\alpha-45) - \frac{\sqrt{2}}{4}$$

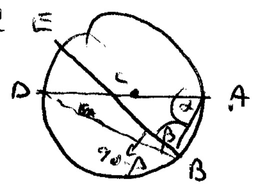
$$\frac{\sqrt{2}}{10} + \frac{\sqrt{2}}{4} = \frac{1}{2}\cos(2\alpha-45)$$

$$\cos(2\alpha-45) = 0.9899 = \cos 8.13$$

$2\alpha-45 = 8.13$, $2\alpha-45 = -8.13$

$\alpha = 26.56°$ $\qquad$ $\alpha = 18.435°$

.16



$\measuredangle CDB = \measuredangle DBC = 90-\beta \Leftarrow$ זווית היקפית $\measuredangle B = 90$ $\qquad$ א.

$\triangle ABD$ $\quad \frac{AB}{2R} = \cos\alpha \qquad AB = 2R\cos\alpha$

$\triangle ABC$ $\quad \frac{AB}{\sin(180-\alpha-\beta)} = \frac{AC}{\sin\beta} \qquad AC = \frac{AB\sin\beta}{\sin(\alpha+\beta)} = \frac{2R\cos\alpha\sin\beta}{\sin(\alpha+\beta)}$

$$S_{ABC} = \frac{AC\cdot AB\sin\alpha}{2} = \frac{2R\cos\alpha\cdot 2R\cos\alpha\sin\beta\sin\alpha}{2\sin(\alpha+\beta)} = \frac{2R^2\cos^2\alpha\sin\beta\sin\alpha}{\sin(\alpha+\beta)}$$

$$\frac{1}{2}R^2 = \frac{2R^2\cos^2\alpha\sin^2\alpha}{\sin 2\alpha} = \frac{2R^2\cos^2\alpha\sin^2\alpha}{2\cos\alpha\sin\alpha} = R^2\cos\alpha\sin\alpha = \frac{1}{2}R^2\sin 2\alpha \quad .ב$$

$1 = \sin 2\alpha$

$2\alpha = 90 \rightarrow \alpha = 45$