2.47
ז

(א) $\sin\alpha - \sin\beta = \cos\alpha + \cos\beta$

$2\sin\frac{\alpha-\beta}{2}\cos\frac{\alpha+\beta}{2} = 2\cos\frac{\alpha+\beta}{2}\cos\frac{\alpha-\beta}{2}$

$2\cos\frac{\alpha+\beta}{2}\left[\sin\frac{\alpha-\beta}{2} - \cos\frac{\alpha-\beta}{2}\right] = 0$

$\cos\frac{\alpha+\beta}{2} = 0$

$\frac{\alpha+\beta}{2} = \frac{\pi}{2}$

$\alpha+\beta = \pi$

לא מתאים למשולש

$\sin\frac{\alpha-\beta}{2} = \sin\left(\frac{\pi}{2} - \frac{\alpha-\beta}{2}\right)$

$\frac{\alpha-\beta}{2} = \frac{\pi}{2} - \frac{\alpha-\beta}{2}$

$2\frac{\alpha-\beta}{2} = \frac{\pi}{2}$

$\alpha-\beta = \frac{\pi}{2}$

$\boxed{\alpha = \beta + \frac{\pi}{2}}$

$\frac{\alpha-\beta}{2} = \pi - \frac{\pi}{2} + \frac{\alpha-\beta}{2}$

$\emptyset$

(ב) $S = \frac{a^2\sin\beta\sin\gamma}{2\sin\alpha} = \frac{a^2\sin\beta\sin(\alpha+\beta)}{2\sin\alpha} = \frac{a^2\sin(\alpha-\frac{\pi}{2})\sin(2\alpha-\frac{\pi}{2})}{2\sin\alpha} =$

$= \frac{a^2\cos\alpha\cos 2\alpha}{2\sin\alpha} = a^2\cot\alpha\cos 2\alpha$