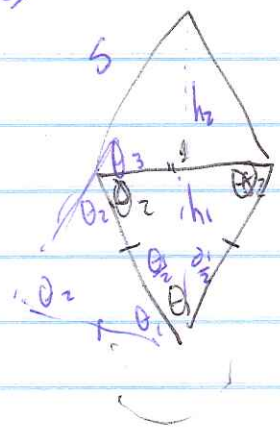

$n \cdot \theta_1 = 2\pi \Rightarrow \theta_1 = \frac{2\pi}{n}$

$2\theta_2 + \theta_1 = \pi \quad (\triangle)$

$2\theta_2 + \theta_3 = \pi$

$\Rightarrow \theta_3 = \theta_1$

$\cos(\theta_3) = \frac{1}{2} / s = \frac{1}{2} \frac{1}{s}$

$s = \frac{1}{2} \frac{1}{\cos(\theta_3)} = \frac{1}{2\cos(\frac{2\pi}{n})}$

$\tan(\frac{\theta_1}{2}) = \frac{1}{2} / h_1 \Rightarrow h_1 = \frac{1}{2\tan(\frac{\theta_1}{2})} = \frac{1}{2\tan(\frac{\pi}{n})}$

$\tan(\theta_3) = \frac{h_2}{1/2} \Rightarrow h_2 = \frac{1}{2}\tan(\theta_3) = \frac{1}{2}\tan(\frac{2\pi}{n})$

$[\text{Area } \star] = n\left(\left[\right] + \left[\right] \right)$

$= n\left(\frac{1}{2}(1) h_2 + \frac{1}{2}(1) h_1 \right)$

$= \frac{n}{2}\left(\frac{1}{2\tan(\frac{\pi}{n})} + \frac{1}{2}\tan(\frac{2\pi}{n}) \right)$

$= \frac{n}{4}\left(\frac{1}{\tan(\frac{\pi}{n})} + \tan(\frac{2\pi}{n}) \right)$

$[\text{Perimeter } \star] = n\left([\text{Perim } \triangle] \right)$

$= n(2 \cdot s) = 2n \frac{1}{2\cos(\frac{2\pi}{n})}$

$$\frac{\text{Perim}}{\text{Area}} = \frac{4/\cos\left(\frac{2\pi}{n}\right)}{\frac{n}{4}\left(\frac{1}{\tan\left(\frac{\pi}{n}\right)} + \tan\left(\frac{2\pi}{n}\right)\right)}$$

$$= \frac{4}{\left(\frac{\cos\left(\frac{2\pi}{n}\right)}{\tan\left(\frac{\pi}{n}\right)} + \tan\left(\frac{2\pi}{n}\right)\right)\cos\left(\frac{2\pi}{n}\right)}$$

$\sin(2\theta) = 2\sin\theta\cos\theta$

$$= \frac{4}{\frac{\cos\left(\frac{2\pi}{n}\right)^2\cos\left(\frac{\pi}{n}\right)}{\sin\left(\frac{\pi}{n}\right)} + \sin\left(\frac{2\pi}{n}\right)}$$

$$= \frac{4\sin\left(\frac{2\pi}{n}\right)}{2\cos\left(\frac{2\pi}{n}\right)^2\cos\left(\frac{\pi}{n}\right)^2 + \sin\left(\frac{2\pi}{n}\right)^2}$$

$$= \frac{4\sin\left(\frac{2\pi}{n}\right)}{\left[2\cos\left(\frac{\pi}{n}\right)^2\right]\cos\left(\frac{2\pi}{n}\right)^2 + 1 - \cos\left(\frac{2\pi}{n}\right)^2}$$

$$= \frac{4\sin\left(\frac{2\pi}{n}\right)}{\left[2\cos\left(\frac{\pi}{n}\right)^2 - 1\right]\cos\left(\frac{2\pi}{n}\right)^2 + 1}$$

$\cos(2\theta) = 2\cos^2\theta - 1$

$$= \boxed{\frac{4\sin\left(\frac{2\pi}{n}\right)}{\cos\left(\frac{2\pi}{n}\right)^3 + 1}}$$