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(4.5) is the inequality (4.1). The equality condition (the regularity of P) follows from (1.3) and the equality conditions in (4.4).

Using (1.10'), we can derive a sharpening of (4.1) for n even. Let $n = 2m$, $n \geq 4$. In the coordinate system S let u_i be defined as follows:

$$u_i^2 = (x_i + x_{i+m})^2 + (y_i + y_{i+m})^2,$$

where $x_{n+i} = x_i$, $y_{n+i} = y_i$, $i = 1, \dots, m$. Then using (1.10') for

$$\mu = \frac{1}{4} \sin^2 \frac{\pi}{n}$$

and (4.4) we obtain the inequality

$$(4.6) \quad 4n \operatorname{tg} \frac{\pi}{n} F + \frac{n}{8} \operatorname{tg}^2 \frac{\pi}{n} \sum_{i=1}^n u_i^2 \leq L^2$$

with the equality holding only for the case of a regular n -gon.

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