Watermark memo

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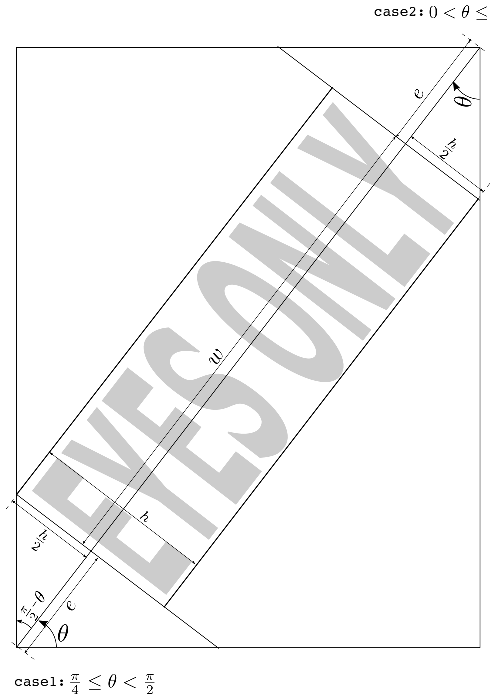

case 1: $\frac{\pi}{4} \leq \theta < \frac{\pi}{2}$

$$\tan\left(\frac{\pi}{2} - \theta\right) = \frac{1}{\tan\theta} = \frac{h/2}{e}$$

$$\therefore h = \frac{2e}{\tan\theta} \tag{1}$$

$$r \overset{def}{=} 2e + w \tag{2}$$

$$k \overset{def}{=} \frac{h}{w} \tag{3}$$

from (1), (3):

$$kw = \frac{2e}{\tan\theta}$$

$$w = \frac{2}{k\tan\theta}e$$

from (2):

$$\begin{aligned} r &= 2e + \frac{2}{k\tan\theta}e \\ &= 2\left(1 + \frac{1}{k\tan\theta}\right)e \\ \therefore e &= \left(1 + \frac{1}{k\tan\theta}\right)^{-1} \cdot \frac{r}{2} \end{aligned}$$

$$\begin{aligned} w &= r - 2e \\ h &= k(r - 2e) \end{aligned}$$

case 2: $0 < \theta \leq \frac{\pi}{4}$

$$\tan\theta = \frac{h/2}{e}$$

$$h = 2e\tan\theta \tag{1'}$$

from (1'), (3):

$$kw = 2e\tan\theta$$

$$w = \frac{2e\tan\theta}{k}$$

from (2):

$$\begin{aligned} r &= 2e + \frac{2e\tan\theta}{k} \\ &= 2e\left(1 + \frac{\tan\theta}{k}\right) \\ \therefore e &= \left(1 + \frac{\tan\theta}{k}\right)^{-1} \cdot \frac{r}{2} \end{aligned}$$

□