# Watermark note

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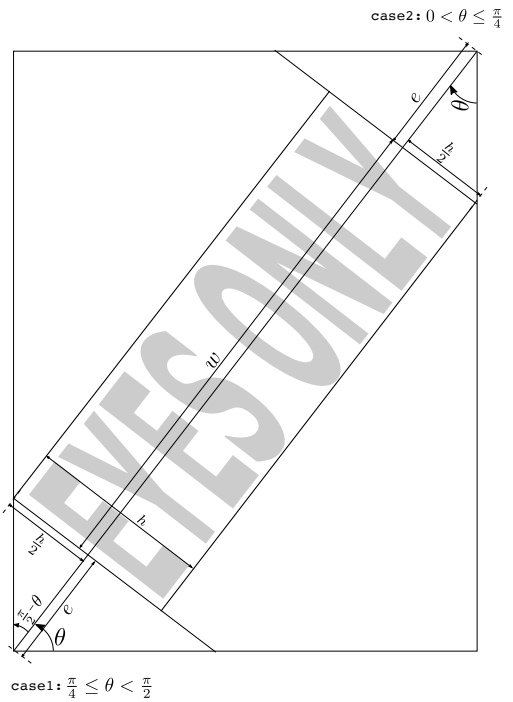




**case 1:** $\frac{\pi}{4} \leq \theta < \frac{\pi}{2}$

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

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

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

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

from (1), (3):

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

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

from (2):

$$r = 2e + \frac{2}{k\tan\theta}e$$

$$= 2\left(1 + \frac{1}{k\tan\theta}\right)e$$

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

$$w = r - 2e$$

$$h = k(r - 2e)$$

**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):

$$r = 2e + \frac{2e\tan\theta}{k}$$

$$= 2e\left(1 + \frac{\tan\theta}{k}\right)$$

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

□