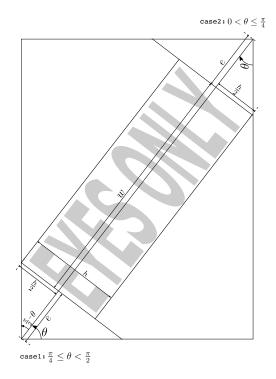
## Watermark note Akihiro SHIMIZU 3/20/2021



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

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

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

$$r \stackrel{def}{=} 2e + w \qquad (2)$$

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

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

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:  $0 < \theta \le \frac{\pi}{4}$ 

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

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

from (1'), (3):

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

from (2):

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

This document is licensed under Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0). https://creativecommons.org/licenses/by-nc-sa/4.0/

