Calcoli: $k = \frac{x_0 y_0}{T'^2}$

$$T' = \eta = 1 - \sqrt[4]{\frac{P_b}{P_a}} = 1 - \sqrt{R}$$

$$T' = 1 - \sqrt{R}$$
$$1 - T' = \sqrt{R}$$
$$2 - T' = 1 + \sqrt{R}$$

$$\frac{y_0}{y_{in}} = \frac{1-T'}{2-T'} \Rightarrow y_0^2 = y_{in}^2 \frac{(1-T')^2}{(2-T')^2}$$

$$\left.\begin{aligned} P &= \sqrt{P_a P_b} \\ x_0 &= \frac{y_0}{P} \end{aligned}\right\} \quad x_0 y_0 = \frac{y_0^2}{P} = \frac{y_0^2}{\sqrt{P_a P_b}}$$

$$k = \frac{x_0 y_0}{T'^2} = \frac{y_0^2}{T'^2 \sqrt{P_a P_b}} = \frac{(1-T')^2}{T'^2 (2-T')^2} \cdot \frac{y_{in}^2}{\sqrt{P_a P_b}}$$

$$\left[\frac{(1-T')^2}{T'^2(2-T')^2} = \frac{\sqrt{R}^2}{(1-\sqrt{R})^2(1+\sqrt{R})^2} = \frac{R}{(1-R)^2} \right]$$

$$\frac{k}{y_{in}^2} = \frac{R}{(1-R)^2} \cdot \frac{1}{\sqrt{P_a P_b}} = \frac{\sqrt{\frac{b}{a}}}{\left(1-\sqrt{\frac{b}{a}}\right)^2} \cdot \frac{1}{\sqrt{ab}} = \frac{1}{a\left(1-\sqrt{\frac{b}{a}}\right)^2}$$

$P_a = a$
$P_b = b$

$$= \frac{1}{a\left(1 - 2\sqrt{\frac{b}{a}} + \frac{b}{a}\right)} = \frac{1}{a - 2\sqrt{ab} + b} = \frac{1}{(\sqrt{a} - \sqrt{b})^2}$$

$$= \frac{1}{(\sqrt{P_a} - \sqrt{P_b})^2}$$

$$\boxed{\begin{aligned} k &= \frac{y_{in}^2}{(\sqrt{P_a} - \sqrt{P_b})^2} = \frac{y_{in}^2}{A^2} \\ \bar{k} &= \sqrt{k} = \frac{y_{in}}{A} \end{aligned}}$$