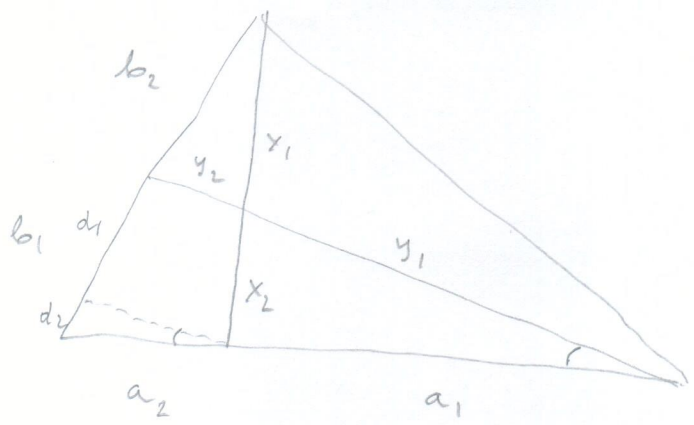


$$\frac{d_2}{a_2} = \frac{b_1}{a_1 + a_2}$$

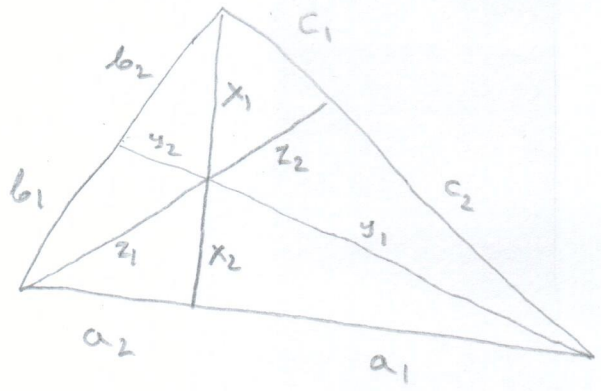
$$d_2 = \frac{a_2 b_1}{a_1 + a_2}$$

$$d_1 = b_1 - d_2 = \frac{a_1 b_1}{a_1 + a_2}$$

$$\frac{x_1}{x_2} = \frac{b_2}{d_1} = \frac{b_2 (a_1 + a_2)}{a_1 b_1}$$

$$\boxed{\frac{x_1}{x_2} = \frac{b_2}{b_1}\left(1 + \frac{a_2}{a_1}\right)}$$

Zatem $$\boxed{\frac{y_1}{y_2} = \frac{a_1}{a_2}\left(1 + \frac{b_1}{b_2}\right)}$$



$$\frac{x_1}{x_2} = \frac{c_1}{c_2}\left(1+\frac{a_1}{a_2}\right) = \frac{b_2}{b_1}\left(1+\frac{a_2}{a_1}\right)$$

$$\frac{c_1}{c_2 a_2} = \frac{b_2}{b_1 a_1}$$

$$\boxed{a_1 b_1 c_1 = a_2 b_2 c_2}$$

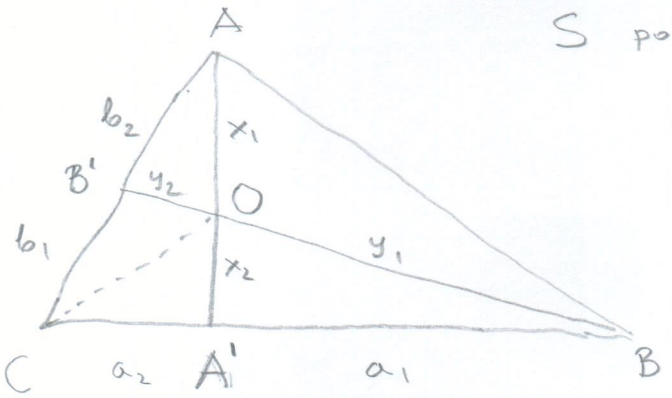
$$\frac{z_1}{z_2} = \frac{b_1}{b_2}\left(1+\frac{c_1}{c_2}\right) = \frac{b_1}{b_2}\left(1+\frac{a_2 b_2}{a_1 b_1}\right)$$

$$\boxed{\frac{z_1}{z_2} = \frac{b_1}{b_2} + \frac{a_2}{a_1}}$$

Dla $\frac{a_1}{a_2} = \frac{b_1}{b_2} = 2$ mamy

$$\boxed{\frac{c_1}{c_2} = \frac{1}{4}}$$

(3)



S pole całości

$$P(\triangle OCA') = \frac{a_2}{a_1+a_2} P(\triangle OCB)$$

$$= \frac{a_2}{a_1+a_2} \frac{x_2}{x_1+x_2} S$$

$$P(\triangle OCB') = \frac{b_1}{b_1+b_2} P(\triangle OCA)$$

$$= \frac{b_1}{b_1+b_2} \frac{y_2}{y_1+y_2} S$$

$$P(\square OB'CA') = \left[\frac{a_2 x_2}{(a_1+a_2)(x_1+x_2)} + \frac{b_1 y_2}{(b_1+b_2)(y_1+y_2)} \right] S$$

Oznaczmy $\alpha = \frac{a_1}{a_2}$, $\beta = \frac{b_1}{b_2}$. Wyrażenie w nawiasie wynosi

$$\frac{1}{(1+\alpha)\left[1+\frac{1}{\beta}\left(1+\frac{1}{2}\right)\right]} + \frac{\beta}{(1+\beta)\left[1+\alpha(1+\beta)\right]}$$

Dla $\alpha = \beta = 2$ otrzymamy

$$\frac{1}{3\left[1+\frac{3}{4}\right]} + \frac{2}{3 \cdot 7} = \frac{4}{3 \cdot 7} + \frac{2}{3 \cdot 7} = \frac{2}{7}$$