



$a+b+c=0$ のとき
 $a\left(\frac{1}{b} + \frac{1}{c}\right) + b\left(\frac{1}{c} + \frac{1}{a}\right) + c\left(\frac{1}{a} + \frac{1}{b}\right)$ の値を求めよ。

$$c = -(a+b) \text{ とおす}$$

$$\begin{aligned} & a\left(\frac{1}{b} - \frac{1}{a+b}\right) + b\left(-\frac{1}{a+b} + \frac{1}{a}\right) - (a+b)\left(\frac{1}{a} + \frac{1}{b}\right) \\ &= \frac{a}{b} - \frac{a}{a+b} - \frac{b}{a+b} + \frac{b}{a} - \frac{(a+b)^2}{ab} \\ &= -1 + \frac{a^2 + b^2 - (a^2 + 2ab + b^2)}{ab} \\ &= -1 - 2 \\ &= \underline{\underline{-3}} \end{aligned}$$