



Bilkent University  
Department of Mathematics

## PROBLEM OF THE MONTH

**Term:** June 2022

Let  $\mathbb{Q}$  and  $\mathbb{Q}^+$  be the set of all rational and all positive rational numbers, respectively. Find all functions  $f : \mathbb{Q}^+ \rightarrow \mathbb{Q}$  satisfying

$$f(x) + f(y) = \left( f(x+y) + \frac{1}{x+y} \right) (1 - xy + f(xy))$$

for all  $x, y \in \mathbb{Q}^+$ .