

Homework 1/18

① Prove $\frac{a}{b} + \frac{c}{d} = \frac{ad+bc}{bd}$ if $b, d \neq 0$

② If $a < b$, $c < 0$, show that $ac > bc$

③ Whether $a \in \mathbb{P}$ or $-a \in \mathbb{P}$, prove $a \cdot a > 0$.

(Do not write a^2 for $a \cdot a$. This notation has not been introduced yet. Even notation " 2 " has not been introduced.)

1/20

① Prove $2 \cdot 2 = 4$

② If $p > 0$, prove that $1/p > 0$.

③ Given $a \in \mathbb{R}$, show that the equation

$$x \cdot x = a, \quad x \in \mathbb{R}, \text{ has}$$

(i) no solution if $a < 0$;

(ii) exactly one solution if $a = 0$;

(iii) at most two solutions if $a > 0$.

(We will later see that in case (iii) there are exactly two solutions. But this cannot be proved from the axioms we have at this point.)