

1. **Analyse** this argument and *explain why it is not valid*:

The temperature in Amsterdam is rising.  
 The temperature in Amsterdam = The temperature in Prague.

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The temperature in Prague is rising.

*Hint:* The terms ‘temperature in Amsterdam’ and ‘the temperature in Prague’ denote *magnitudes* of type  $\tau_{\tau\omega}$ . We construct them like this:

$\lambda\omega\lambda t [{}^0\text{Temperature\_in}_{wt} {}^0\text{Amsterdam}]$ ,  $\lambda\omega\lambda t [{}^0\text{Temperature\_in}_{wt} {}^0\text{Prague}]$ ,  
 where  $\text{Temperature\_in}/(\tau\iota)_{\tau\omega}$ .

2. **Prove the validity of this argument**:

The Mayor of Ostrava visited Brno.

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The Mayor of Ostrava exists.

*In which supposition does the meaning of ‘the Mayor of Ostrava’ occur in the premise and in which supposition in the conclusion?*

3. **Analyse**:

For all numbers  $x$  holds that dividing  $x$  by 0 is improper.

*Hint:* Apply  $\text{Improper}/(o*_1)$ : the set of constructions  $v$ -improper for every valuation  $v$ .

4. **Determine**, to which construction is a given construction  $v(\pi/x)$ -congruent, i.e., it  $v$ -constructs the same object for the valuation that associates  $x$  with the number  $\pi$ :

$[{}^0\text{Sub } [{}^0\text{Tr } x] {}^0y {}^0[{}^0\text{Sin } y]]$

${}^2[{}^0\text{Sub } [{}^0\text{Tr } x] {}^0y {}^0[{}^0\text{Sin } y]]$

5. What does the construction  $[{}^0\text{Sub } [{}^0\text{Tr } x] {}^0y {}^0[{}^0\text{Wife\_of}_{wt} y]]$   $v(\text{John}/x)$ -construct?