HW3

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1.
$$\dfrac{\dfrac{\dfrac{\dfrac{\dfrac{\dfrac{\dfrac{}{\Gamma_1 \vdash n\colon \text{int}}\,VariableRule \quad \dfrac{}{\Gamma_1 \vdash 0\colon \text{int}}\,ConstantRule}{\Gamma_1 \vdash n > 0\colon \text{bool}} \quad \dfrac{}{\Gamma_1 \vdash n\colon \text{int}}\,VariableRule \quad \dfrac{\dfrac{}{\Gamma_1 \vdash 0\colon \text{int}}\,ConstantRule \quad \dfrac{}{\Gamma_1 \vdash n\colon \text{int}}\,VariableRule}{\Gamma_1 \vdash 0 - n\colon \text{int}}}{[n\colon \text{int}] \vdash \text{if } n > 0 \text{ then } n \text{ else } 0 - n\colon \text{int}}}{[] \vdash \text{fun } n \to \text{if } n > 0 \text{ then } n \text{ else } 0 - n\colon \text{int} \to \text{int}} \quad \dfrac{\dfrac{}{\Gamma_2 \vdash \text{abs } : \text{int} \to \text{int}}\,VariableRule \quad \dfrac{}{\Gamma_2 \vdash 3\colon \text{int}}\,ConstantRule}{[\text{abs } : \text{int} \to \text{int}] \vdash \text{abs } 3\colon \text{int}}}{[] \vdash \text{fun } n \to \text{if } n > 0 \text{ then } n \text{ else } 0 - n \text{ in abs } : \text{int}}$$

where $\Gamma_1 = [n\colon \text{int}]$ and $\Gamma_2 = [\text{abs}\colon \text{int} \to \text{int}]$