$tmvar$, x, y variables

typ, t	::=		types	
	|	**nat**		Natural numbers
	|	$t_1 \rightarrow t_2$		Function types

exp, e	::=		expressions	
	|	x		Variables
	|	**z**		Zero
	|	**s** e		Successor
	|	**rec** $e\{\mathbf{z} \rightarrow e_0; \mathbf{s}\, x \rightarrow e_1\}$	bind x in e_1	Primitive recursion over nats
	|	$\lambda(x : t)e$	bind x in e	Functions
	|	$e_1\, e_2$		Application

env, Γ	::=		typing environment	
	|	$\emptyset$		empty
	|	$\Gamma, x : t$		cons

$\boxed{e\,\mathbf{val}}$

$$\frac{}{\mathbf{z}\,\mathbf{val}}\ \text{VAL\_Z}$$

$$\frac{e\,\mathbf{val}}{\mathbf{s}\,e\,\mathbf{val}}\ \text{VAL\_S}$$

$$\frac{}{\lambda(x : t)e\,\mathbf{val}}\ \text{VAL\_ABS}$$

$\boxed{\Gamma \vdash e : t}$

$$\frac{\begin{array}{c}\mathbf{uniq}\,\Gamma \\ x : t\,\mathbf{in}\,\Gamma\end{array}}{\Gamma \vdash x : t}\ \text{TYPING\_VAR}$$

$$\frac{\mathbf{uniq}\,\Gamma}{\Gamma \vdash \mathbf{z} : \mathbf{nat}}\ \text{TYPING\_Z}$$

$$\frac{\Gamma \vdash e : \mathbf{nat}}{\Gamma \vdash \mathbf{s}\,e : \mathbf{nat}}\ \text{TYPING\_S}$$

$$\frac{\begin{array}{c}\Gamma \vdash e : \mathbf{nat} \\ \Gamma \vdash e_0 : t \\ \Gamma, x : \mathbf{nat} \vdash e_1 : t \rightarrow t \\ e_1\,\mathbf{val}\end{array}}{\Gamma \vdash \mathbf{rec}\,e\{\mathbf{z} \rightarrow e_0; \mathbf{s}\,x \rightarrow e_1\} : t}\ \text{TYPING\_REC}$$

$$\frac{\Gamma, x : t_1 \vdash e : t_2}{\Gamma \vdash \lambda(x : t_1)e : t_1 \rightarrow t_2}\ \text{TYPING\_ABS}$$

$$\frac{\begin{array}{c}\Gamma \vdash e_1 : t_1 \rightarrow t_2 \\ \Gamma \vdash e_2 : t_1\end{array}}{\Gamma \vdash e_1\, e_2 : t_2}\ \text{TYPING\_APP}$$

$\boxed{e \rightsquigarrow e'}$

$$\frac{e \rightsquigarrow e'}{\mathbf{s}\,e \rightsquigarrow \mathbf{s}\,e'}\ \text{EVAL\_S}$$

$$\frac{e_1 \rightsquigarrow e_1'}{e_1\, e_2 \rightsquigarrow e_1'\, e_2} \quad \text{EVAL\_APP\_LEFT}$$

$$\frac{\begin{array}{c} e_1\ \mathbf{val} \\ e_2 \rightsquigarrow e_2' \end{array}}{e_1\, e_2 \rightsquigarrow e_1\, e_2'} \quad \text{EVAL\_APP\_RIGHT}$$

$$\frac{e_2\ \mathbf{val}}{(\lambda(x:t)e_1)\, e_2 \rightsquigarrow e_1\{e_2/x\}} \quad \text{EVAL\_BETA}$$

$$\frac{e \rightsquigarrow e'}{\mathbf{rec}\ e\{\mathbf{z} \to e_0;\ \mathbf{s}\ x \to e_1\} \rightsquigarrow \mathbf{rec}\ e'\{\mathbf{z} \to e_0;\ \mathbf{s}\ x \to e_1\}} \quad \text{EVAL\_REC\_SCRUT}$$

$$\frac{}{\mathbf{rec}\ \mathbf{z}\{\mathbf{z} \to e_0;\ \mathbf{s}\ x \to e_1\} \rightsquigarrow e_0} \quad \text{EVAL\_REC\_Z}$$

$$\frac{\mathbf{s}\ e\ \mathbf{val}}{\mathbf{rec}\ \mathbf{s}\ e\{\mathbf{z} \to e_0;\ \mathbf{s}\ x \to e_1\} \rightsquigarrow e_1\{e/x\}\,(\mathbf{rec}\ e\{\mathbf{z} \to e_0;\ \mathbf{s}\ x \to e_1\})} \quad \text{EVAL\_REC\_S}$$

```
Definition rules:        16 good     0 bad
Definition rule clauses: 35 good     0 bad
```