

$$\begin{array}{ccccc}
F(T_2) & \xleftarrow{F_{r_2}} & F(R) & \xrightarrow{F_{r_1}} & F(T_1) \\
\uparrow t_2 & & \uparrow r & & \uparrow t_1 \\
T_2 & \xleftarrow{r_2} & R & \xrightarrow{r_1} & T_1 \\
\downarrow \text{id} & & \downarrow \text{id} & & \downarrow m \\
T_2 & \xleftarrow{\quad r_2 \quad} & R & \xrightarrow{\quad mr_1 \quad} & T_2 \\
\downarrow t_2 & & \downarrow r & & \downarrow t_2 \\
F(T_2) & \xleftarrow{\quad F_{r_2} \quad} & F(R) & \xrightarrow{\quad F_{mr_1} \quad} & F(T_2)
\end{array}$$