Teste - 21/01/21

1) Por 5.126, temos que $invM = [R,S] \subseteq id$
É usada para nenhum trabalhador ter um turno atribuído on-line ou na loja, em simultâneo.

2) $f \cdot g^{\circ} \subseteq (f \cdot g^{\circ})^{\circ}$
$\Leftrightarrow$ {5.16 ; 5.15}
$f \cdot g^{\circ} \subseteq g \cdot f^{\circ}$
$\Leftrightarrow$ {5.46 ; 5.47 ; 5.13}
$g^{\circ} \cdot f \cdot g^{\circ} \cdot f \subseteq id$
$\Leftrightarrow$ {5.49}
$\frac{f}{g} \cdot \frac{f}{g} \subseteq id$ //

3) $c \langle id, T \rangle^{\circ} (a,b)$
$\Leftrightarrow$ {Conversa}
$(a,b) \langle id, T \rangle c$
$\Leftrightarrow$ {5.101}
$a \, id \, c \wedge b T c$
$\Leftrightarrow$ {Def id; função id; $\_ T \_ = True$}
$a = c$

$X \subseteq \langle id, T \rangle^{\circ}$
$\Leftrightarrow X^{\circ} \subseteq \langle id, T \rangle$
ou $\Leftrightarrow$
$\begin{cases} \pi_1 \cdot X^{\circ} \subseteq id \\ \pi_2 \, X^{\circ} \subseteq T \Leftrightarrow true \end{cases}$
$\Leftrightarrow$
$X^{\circ} \subseteq \pi_1^{\circ}$
$\Leftrightarrow$
$X \subseteq \pi_1$
$\therefore$
$\langle id, T \rangle^{\circ} = \pi_1$

$X \subseteq \pi_1 \cdot \langle R, S \rangle$
$\Leftrightarrow$ {F2}
$X \subseteq \langle id, T \rangle^{\circ} \cdot \langle R, S \rangle$
$\Leftrightarrow$ {5.108}
$X \subseteq (id^{\circ} \cdot R) \cap (T^{\circ} \cdot S)$
$\Leftrightarrow$ {$id^{\circ} = id$; $T^{\circ} = T$}
$X \subseteq (id \cdot R) \cap (T \cdot S)$
$\Leftrightarrow$ {}
$X \subseteq R \cap T \cdot S$
$\Leftrightarrow$
$X \subseteq pS \cdot R$

4) $R \subseteq R \cdot R^{\circ} \cdot R$

$\Leftarrow$ { Lowering upper bound }

$R \subseteq (R \cdot R^{\circ} \cap id) \cdot R$

$\Leftrightarrow$ { Def. range }

$R \subseteq \rho R \cdot R$

$\Leftrightarrow$ { ?? }

true

5) $R \dagger S = R \Leftarrow S \subseteq R$

$R \dagger S \subseteq X$

$\Leftrightarrow$ { Def. $\dagger$ }

$S \cup R \cap \bot / S^{\circ} \subseteq X$

$\Leftrightarrow$ { Raise lower side

$R \cup R \cap \bot / S^{\circ} \subseteq X \subseteq R$

$\Leftarrow$

$R \subseteq X$

6) $\text{break} \left((R^* \times R^*) \leftarrow R^* \leftarrow (id \leftarrow R) \right) \text{break}$

$\Leftrightarrow$ { RA }

$\text{break} \cdot (id \leftarrow R) \subseteq \left((R^* \times R^*) \leftarrow R^* \right) \cdot \text{break}$

$\Leftrightarrow$ { Shunting; Variáveis }

$f (id \leftarrow R)\, g \Rightarrow (\text{break } f) \left((R^* \times R^*) \leftarrow R^* \right) (\text{break } g)$

$\Leftrightarrow$ { RA 2x; Nat-id }

$f \cdot R \subseteq g \Rightarrow (\text{break } f) \cdot R^* \subseteq (R^* \times R^*) \cdot (\text{break } g)$

$\Leftrightarrow$ { Shunting; Variáveis }

$(y R x \Rightarrow f y = g x) \Rightarrow (m R^* n \Rightarrow (\text{break } f\, m)(R^* \times R^*)(\text{break } g\, n))$

$R := r,$

$y = r x$

$f(r x) = g x$ $\qquad$ $\text{break } f\, (\text{map } r\, n) = (\text{map } r \times \text{map } r)(\text{break } f\, (r\, n))$