习题七 10. (1) <2,67, <3,177, <0.07 (2) <2 127 **3**) 无 4. R.R = { <0, a>, <0,3>, <1,3>} R-1 = { < 1,0> < 2,0> , < 3,0> , < 2.1> , < 3,1> , < 3,2> } R1 fo. 1 } = { do,1> ,<0,2> ,<0,3>,<1,2> ,<1,3> } R[11,2] = 12, 33 15. A= { < {\$\phi, {\phi}} }, \$\phi > , < \phi, {\phi} > } $A^2 = \{ \{ \{ \phi \} \}, \{ \phi, \{ \phi \} \} \} \}$ $A^3 = \phi$ $A \setminus \{\phi\} = \{\langle \phi, \{\phi, \{\phi\}\} \rangle\}$ $A[\phi] = \phi$ $A[\{\{\phi\}\}] = \{\phi\}$ A > 3 4 5 7 = 5 < 1 4 7 , 0 > 3 18.证明定理74(1)(2)(4) (1) Fo(GUH) = Fo GUFoH **注取<x,y>** <x,y> eF . CGUH) ⇒∃t (<x,t>eF Λ (<t,y>∈G V <t,y>∈H)) ←> 3t ((<x,t> eF / <t,y> eG) V(xx,t> eF / <t,y eH)) ⇔ «x,y> ∈ FoG V «x,y> ∈ FoH <> <×,y> € FoG UFOH

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(2) (GUH) oF = GOF U HOF
          任取 <×,y>
         <x,y> E(GUH) oF/
 \Leftrightarrow \exists t (\langle x, t \rangle \in (GVH) \land (t,y) \in F)
\Leftrightarrow \exists t ((\langle x, t \rangle \in K \land (t, y) \in F) V(\langle x, t \rangle \in H \land (t, y) \in F))

 ⇔ <x,y> ∈ (GoF V HoF)
(4) (GNH) ∘F ⊆ G ∘F ∩H ∘F
       任取 <>/,y>
       <x,y> e(GnH) oF
⇔ ∃t (<x,t> ∈(GnH) Λ <t,y> ∈F )
 ⇔ at (<x,t> ∈G ∧ <x,t> ∈H ∧ <t,y> €F)

⇒ ∃t ((<x,t> ∈ G ) < €, y > ∈ F ) ∧ (<x,t> ∈ H ) < €, y > ∈ F ))

 ⇒ It(<x,t> ∈ G Λ<\(,y> ∈ F) / It(<x,t> ∈ H Λ<\(,y> ∈ F)

⇔ ⟨x,y> ∈ (GoF ∩ HoF)

20. R, R, 为A上的关系,证明:
 (1) (R_1 \cup R_2)^{-1} = R_1^{-1} \cup R_2^{-1}
                                                                       (2) (R_1 \cap R_2)^{-1} = R_1^{-1} \cap R_2^{-1}
         迁取 <×, y >
                                                                            \langle x, y \rangle \in (R_1 \cup R_2)^{-1}
                                                                            <x,y> E (RI / R2) -1
  ⟨Y, x > € (R, U R₂)

⇔ < y, x > E (R, ∩R₂)

 ⇔ W,x> ∈ R, U <y,x>∈R2
                                                                      ⇔ <y, x> ∈ R, Λ <y, x> € R<sub>2</sub>
 \Leftrightarrow <xiy> \in \mathbb{R}_1^{-1} \cup (x_1y) \in \mathbb{R}_2^{-1}
                                                                       ⇔ <xiy> ∈ Ri nexiy> ∈ R2
 \Leftrightarrow \langle x, y \rangle \in (R_1^{-1} \cap R_2^{-1})
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