

10

27- :

1

$F \times G$. $F \subseteq X, G \subseteq Y$. " X, Y .
 $\overline{A \times B} = \overline{A} \times \overline{B}$. $A \subseteq X, B \subseteq Y$, " X, Y .
 $X \times Y$

2

X . $\Delta = \{(x, x) : x \in X\}$ $X \times X$. " X
 $X \times X - \Delta$

3

f . $f \circ g = id_Y$ $f : X \rightarrow Y, g : Y \rightarrow X$, " X, Y .
 $f \Leftrightarrow f : X \rightarrow Y$

4

$(x_1, y_1) \sim (x_2, y_2) \Leftrightarrow x_1 + y_1^2 = x_2 + y_2^2 : \mathbb{R}^2$.
 \mathbb{R}^2 / \sim . $\mathbb{R} - \hat{f}$.
 $(x_1, y_1) \sim (x_2, y_2) \Leftrightarrow x_1^2 + y_1^2 = x_2^2 + y_2^2 : \mathbb{R}^2$.
 $? \mathbb{R}^2 / \sim$

5

$\dagger = \{\emptyset, X, \{0\}\}$ $X = \{0, 1\}$ (Sierpinsky)

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$$f(x) = \begin{cases} 0 & x \in \left[0, \frac{1}{2}\right) \\ 1 & x \in \left[\frac{1}{2}, 1\right] \end{cases} \quad f: I \rightarrow \{0,1\} \quad I = [0,1]$$

$$I/\sim \quad a \sim b \Leftrightarrow f(a) = f(b) \quad I$$

6

$$: \quad \mathbb{R} \quad X$$
$$[0, \infty) \quad X \quad (x = -y) \vee (x = y) \Leftrightarrow x \sim y$$

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