

הצגה $F: e \rightarrow e'$ עוקב

$(\text{inty sk, } f \text{ אר (i)})$ $\text{Hom}_C(X, Y) \rightarrow \text{Hom}_C(FX, FY)$ pl

$\gamma \text{ } \exists X \text{ ו } Y \in e'$ pl inty sk f pl F (ii)

inty sk $F(f)$ pl $f: X \rightarrow Y$ pl $FX \cong Y$ pl F (iii)

inty sk $\text{for: } R\text{Mod} \rightarrow \text{Set}$ (1)
 $R = \mathbb{Z}$ pl
 inty sk for -
 inty sk $\text{for: Top} \rightarrow \text{Set}$ (2)

C, C' inty sk

$$\text{ob}(C \times C') = \text{ob}(C) \times \text{ob}(C')$$

$$\text{Hom}_{C \times C'}((x, y), (x', y')) = \text{Hom}_C(x, x') \times \text{Hom}_C(y, y')$$

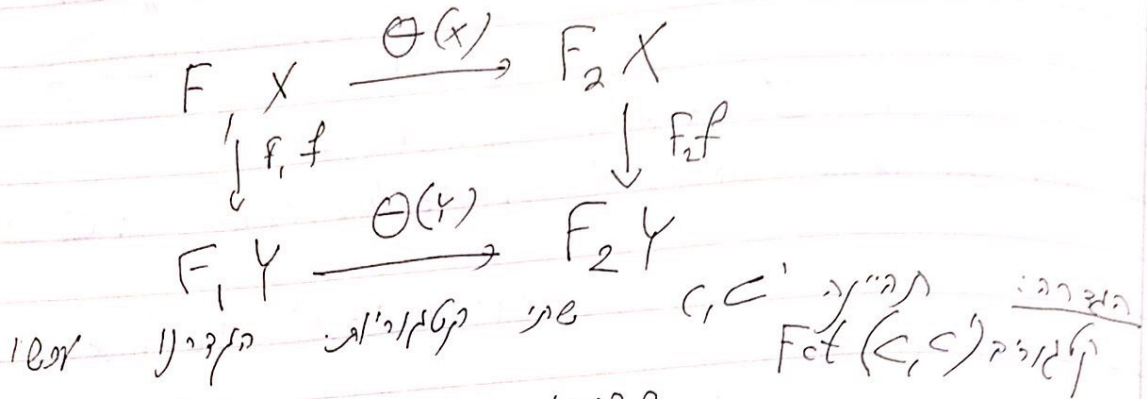
$F: C \times C' \rightarrow C''$ inty sk
 $F(x, \cdot): C' \rightarrow C''$ $X \in C$ pl
 $F(\cdot, Y): C' \rightarrow C''$ $Y \in C$ pl

$$\begin{array}{ccc} x & \xrightarrow{f} & x' \in C \\ y & \xrightarrow{g} & y' \in C' \end{array}$$

$$\begin{array}{ccc} F(x, y) & \xrightarrow{F(x, y)} & F(x, y) \\ \downarrow F(\cdot, y) & \text{O} & \downarrow F(\cdot, y) \\ F(x', y) & \xrightarrow{F(x', y)} & F(x', y) \end{array}$$

$$\text{Hom}_C(\cdot, \cdot) : \mathcal{C}^{\text{op}} \times \mathcal{C} \rightarrow \text{set}$$

$\Theta(x) \in \text{Hom}_C(FX, FY)$ $\Theta(x) : F_1 X \rightarrow F_2 X$
 $\Theta(y) : F_1 Y \rightarrow F_2 Y$
 $f : X \rightarrow Y$
 $F_1, F_2 : \mathcal{C} \rightarrow \mathcal{C}$



$$\mathcal{C} = \left\{ \begin{array}{l} \text{הומומורפיזמים} \\ \text{סופרים} \\ \mathbb{Q} \end{array} \right\}$$

$$\text{Hom}_{\mathbb{Q}}(L_1, L_2) = \text{Hom}_{\mathbb{Q}\text{-alg}}(L_1, L_2)$$

$$F : \mathcal{C} \rightarrow \text{set} \quad \mathbb{Q} \text{ to } \bar{\mathbb{Q}}$$

$$L \rightarrow \text{Specmax}(L \otimes_{\mathbb{Q}} \bar{\mathbb{Q}})$$

$$\text{Aut}(F) = \text{Gal}(\bar{\mathbb{Q}}/\mathbb{Q}) = \pi^{\text{et}}(\mathbb{Q})$$

מפונקטור קבוצות פונקטור...

$$\begin{array}{l}
 \text{פונקטור } F : \mathcal{C} \rightarrow \text{set} \\
 G : \mathcal{C}' \rightarrow \mathcal{C} \\
 F \circ G \stackrel{\text{Fct}}{=} \text{id}_{\mathcal{C}'} \\
 G \circ F \stackrel{\text{Fct}}{=} \text{id}_{\mathcal{C}}
 \end{array}$$

$\cong_{\text{Fct}} \rightarrow = \text{אלו} \otimes \text{פונקטור}$

$\mathbb{C} \xrightarrow{F} \mathbb{C}^k$ \Leftrightarrow $F: \mathbb{C} \rightarrow \mathbb{C}^k$ \Leftrightarrow $F \cdot C \rightarrow \mathbb{C}^k$ \Leftrightarrow $\text{Col}(F)$
 (ה) F \Leftrightarrow $\text{Col}(F)$ \Leftrightarrow $F \cdot C \rightarrow \mathbb{C}^k$ \Leftrightarrow $\text{Col}(F)$

$N = \mathbb{Z}_{\geq 0}$ \Leftrightarrow $\text{Hom}_{\mathbb{C}}(M, N) = M_{m,n}(\mathbb{C})$
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$F: \mathbb{C} \rightarrow \mathbb{C}^k$ \Leftrightarrow $F(A) = \mathbb{C}^n$
 $M \in M_{n,k}, FM = M: \mathbb{C}^n \rightarrow \mathbb{C}^k$

$$FM = M: \mathbb{C}^n \rightarrow \mathbb{C}^k \quad M \in M_{n,k}$$

$F: \mathbb{C} \rightarrow \mathbb{C}^k$ \Leftrightarrow $F(A) = \mathbb{C}^n$