$$\mathbb{F}\ \text{alg abg}:\quad \mathfrak{I} \underset{\text{ideal}}{\sqsubset} {}^{\mathbb{F}^n}\triangleright\mathbb{F} \overset{\text{strong}}{\underset{\text{Hilbert}}{\Longrightarrow}} \neg\underbrace{\mathbb{F}^n \llcorner_{\mathfrak{I}}} {}^{\mathbb{F}^n}\triangleright\mathbb{F} = \sqrt{\mathfrak{I}}$$

$$\text{noeth}\ {}^{\mathbb{F}^n}\triangleright\mathbb{F} \Rightarrow \mathfrak{I} = \langle\, \gamma^{\alpha}\, \rangle\ {}^{\mathbb{F}^n}\triangleright\mathbb{F}$$

$$\mathbb{F}^n \llcorner_{\mathfrak{I}} \underset{\text{ex}}{\sqsubset} \mathbb{F}^n$$

$$1 \in \neg\underbrace{\mathbb{F}^n \llcorner_{\mathfrak{I}}}\ {}^{\mathbb{F}^n}\triangleright\mathbb{F} \Rightarrow \underbrace{\mathbb{F}^n \llcorner_{\mathfrak{I}}} \big/\ 1 = 0$$

$$\mathbb{I} = \langle\, {}^{X}\gamma^{\alpha} : 1 - {}^{X}\gamma Z \,\rangle\ {}^{\mathbb{F}^{1+n}}\triangleright\mathbb{F}$$

$$\mathbb{F}^{1+n} \llcorner_{\mathbb{I}} = \varnothing$$

$$\lightning\ \bigvee a_0 : a \in \mathbb{F}^{1+n} \llcorner_{\mathbb{I}} \Rightarrow \begin{cases} {}^{a}\gamma^{\alpha} = 0 \Rightarrow a \in \mathbb{F}^n \llcorner_{\mathfrak{I}} & \Rightarrow {}^{a}\gamma = 0 \\ a_0\, {}^{a}\gamma = 1 & \Rightarrow {}^{a}\gamma \neq 0 \end{cases} \lightning$$

$$\overset{\text{weak}}{\underset{\text{Hilb}}{\Longrightarrow}} \mathbb{I} = \langle\, {}^{X}\gamma^{\alpha} : 1 - {}^{X}\gamma Z \,\rangle\ {}^{\mathbb{F}^{1+n}}\triangleright\mathbb{F} = {}^{\mathbb{F}^{1+n}}\triangleright\mathbb{F} \Rightarrow$$

$$1 = {}^{X}\gamma^{\alpha}\ {}^{X}_{\alpha}\tau^{Z} + \underline{1 - {}^{X}\gamma Z}\ {}^{X}\tau^{Z} = {}^{X}\gamma^{\alpha}\ {}^{X}_{\alpha}\tau_j Z^j + \underline{1 - {}^{X}\gamma Z}\ {}^{X}\tau_k Z^k = \underbrace{{}^{X}\gamma^{\alpha}\, {}^{X}_{\alpha}\tau_0 + {}^{X}\tau_0}_{=1} + \underbrace{{}^{X}\gamma^{\alpha}\, {}^{X}_{\alpha}\tau_{k+1} + {}^{X}\tau_{k+1} - {}^{X}\gamma\, {}^{X}\tau_k}_{=0} Z^{k}$$

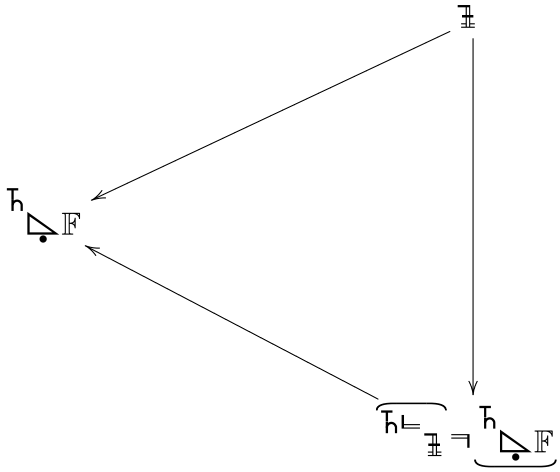
$$d = \underbrace{\deg {}^{X}_{\alpha}\tau} \curlyvee \underbrace{\deg {}^{X}\tau + 1}$$

$${}^{X}\gamma^{d} = \underbrace{{}^{X}\gamma^{\alpha}\, {}^{X}_{\alpha}\tau_0 + {}^{X}\tau_0}_{=1}\ {}^{X}\gamma^{d} + \underbrace{{}^{X}\gamma^{\alpha}\, {}^{X}_{\alpha}\tau_{k+1} + {}^{X}\tau_{k+1} - {}^{X}\gamma\, {}^{X}\tau_k}_{=0}\ {}^{X}\gamma^{d-1-k}$$

$$= \underset{\in\,\mathfrak{I}}{{}^{X}\gamma^{\alpha}}\ \underbrace{{}^{X}_{\alpha}\tau_0\, {}^{X}\gamma^{d} + {}^{X}_{\alpha}\tau_{k+1}\, {}^{X}\gamma^{d-1-k}} + {}^{X}\tau_0\, {}^{X}\gamma^{d} + \underbrace{{}^{X}\tau_{k+1}\, {}^{X}\gamma^{d-1-k} - {}^{X}\gamma\, {}^{X}\tau_k\, {}^{X}\gamma^{d-1-k}}_{= -{}^{X}\tau_0\, {}^{X}\gamma^{d}} \in \mathfrak{I} \Rightarrow {}^{X}\gamma \in \sqrt{\mathfrak{I}}$$

$$\mathbb{F}\triangleright \ni \hbar \Rightarrow {}^{\hbar}\triangleright\mathbb{F} \in \overset{e}{\triangleleft}\mathbb{F}\ \text{abel elg}$$

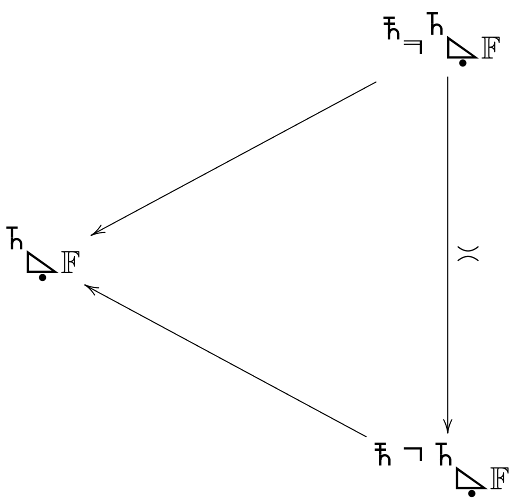
$$\mathfrak{I} \underset{\text{ex}}{\sqsubset} {}^{\hbar}\triangleright\mathbb{F}$$



$$\mathrm{Rad}\ ⧺ = \overbrace{ħ⊨ ⧺}\neg \underbrace{ħ \triangleright \mathbb{F}}$$

$$ħ \sqsupset ħ = \mathbb{F} \triangleleft \overbrace{ħ \triangleright \mathbb{F}}$$

$$ħ_\neg\, ħ \triangleright \mathbb{F} = \frac{ʔ \in ħ \triangleright \mathbb{F}}{\bigwedge_{ħ}^{ħ}\, {}^{ħ}ʔ = 0}$$



$$\hbar_{\urcorner}\ {}^{\bar{h}}\triangle_{\bullet}\mathbb{F} \sqsupset \bar{\hbar}_{\urcorner}\ {}^{\bar{h}}\triangle_{\bullet}\mathbb{F} \Leftrightarrow \hbar \subset \bar{\hbar}$$

$$\bigcup_i \bar{h}_{i\urcorner}\ {}^{\bar{h}}\triangle_{\bullet}\mathbb{F} = \bigcap_i \bar{h}_{i\urcorner}\ {}^{\bar{h}}\triangle_{\bullet}\mathbb{F}$$

$$\bigwedge_x^R \bigvee_\ell^{\mathbb{N}} a^\ell x \in \mathfrak{m}$$

$$\mathfrak{m} \subset \frac{x \in R}{\bigvee_\ell^{\mathbb{N}} a_r^\ell x \in \mathfrak{m}} \underset{\text{ideal}}{\sqsubset} R$$

$$\underset{\max}{\Longrightarrow} \frac{x \in R}{\bigvee_\ell^{\mathbb{N}} a_r^\ell x \in \mathfrak{m}} = R$$

$$a_r \notin \mathfrak{m} \Longrightarrow \mathfrak{p}^* + \mathfrak{m}R\left(X\right) \neq R\left(X\right)$$

$$\lightning\ \mathfrak{p}^* + \mathfrak{m}R\left(X\right) = R\left(X\right) \Longrightarrow \bigvee_{f}^{\mathfrak{p}^*} \bigvee_{{}_i c}^{\mathfrak{m}} 1 = {}^X f + \sum_{i} {}_i c\, X^i \underset{\text{eucl}}{\Longrightarrow} \underbrace{{}^X f - 1}\, X^{r\text{-}1} = {}^X g\ {}^X h + \sum_{r}^{j} b_j\, X^j \Longrightarrow \bigwedge_{r}^{j} \bigvee_{\ell_j}^{\mathbb{N}} a_r^{\ell_j}\, b_j \in \mathfrak{m}$$

$$\ell = \max_j \ell_j \Longrightarrow \bigwedge_{j}^{r} a_r^{\ell}\, b_j \in \mathfrak{m} \Longrightarrow a_r^{\ell} \underbrace{{}^X f - 1}\, X^{r\text{-}1} = a_r^{\ell}\ {}^X g\ {}^X h + \sum_{r}^{j} a_r^{\ell}\, b_j\, X^j$$

$$\Longrightarrow \underbrace{a_r^{\ell} + a_r^{\ell} b_{r\text{-}1}}\, X^{r\text{-}1} + \sum_{r-1}^{j} a_r^{\ell}\, b_j\, X^j = a_r^{\ell}\, X^{r\text{-}1} + \sum_{r}^{j} a_r^{\ell}\, b_j\, X^j = a_r^{\ell}\ {}^X f\ X^{r\text{-}1} + a_r^{\ell}\ {}^X g\ {}^X h \in \mathfrak{p}^*$$

$$a_9^{\ell} \notin \mathfrak{m} \ni a_r^{\ell}\, b_{r\text{-}1} \Longrightarrow a_r^{\ell} + a_r^{\ell}\, b_{r\text{-}1} \neq 0\ \lightning$$