



Title: Vorarbeiten zum Plankalkül. Schachprogramme
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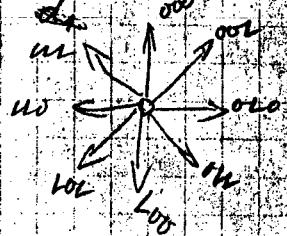
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- 1) $\vec{v} = 6 \text{ m/s}$
 2) $18^\circ - 90^\circ - 18^\circ - 18^\circ$
 3) $v = 2 \text{ m/s}$
 4) \vec{v}
 5) \vec{v}_x
 6) $\vec{v} = 5 \text{ m/s}$

$$\text{Gesuch} (x, y) = \text{Richt} (x, y)$$

$$\text{Richt} (x, y) = \frac{\vec{y}}{\|\vec{y}\|} = \frac{y}{\sqrt{x^2 + y^2}}$$

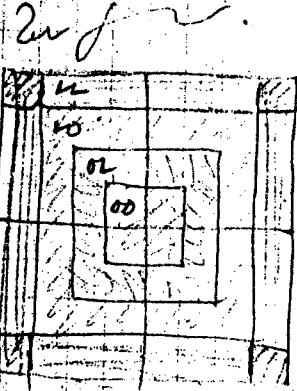
$$\text{Richt} (x, y) = \frac{1}{\sqrt{2}} \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$



$$\boxed{\text{Gesuch} (x, y, z) = \frac{\vec{y}}{\|\vec{y}\|} = \frac{y}{\sqrt{x^2 + y^2 + z^2}}}$$

~~Hilf~~

- 1.) Ein Vektor $\vec{v} = 2 \text{ m/s}$ ist gegeben.
- 2.) $\vec{v} = \sqrt{2} \text{ m/s}$
- 3.) Ist $\vec{v} = 2 \text{ m/s}$ ein Grundvektor?
- 4.) $\vec{v} = (1, 1) \text{ m/s}$ ist ein Grundvektor?



Eck(x), Kant(x)

Schr.(x), Win(x)

Farb(x) = $\begin{cases} b & \text{im P.D.} \\ a & \text{im Zonen-N} \end{cases}$

Zonen(N) = ... P.D.

Nord(x)

$Eck(x) \sim M \quad Ecke(x) \rightarrow (\text{Zone}(x) = LL)$

Schr.(x) $\sim [Farb(x) = a]$

Win(x) $\sim [Farb(x) = L]$. ~~Kant(x) K~~

$K^1(x), K^{1,2}(x) \sim Schr. g$

$K^{1,2}(x) = K_2(K^1(x))$

$\tilde{K}^{1,2}(x)$ wird in 1,2 Sx

$$J_1 \cdot R_1 + J_2 \cdot R_2 = V$$

$$V = J \cdot R$$

$$(J_1 + J_2) \cdot R_G = V$$

$$\begin{aligned} J_1 \cdot R_1 &= V \\ J_2 \cdot R_2 &= V \end{aligned}$$

$$\begin{aligned} J_1 &= \frac{V}{R_1} \\ J_2 &= \frac{V}{R_2} \end{aligned}$$

$$\left(\frac{V}{R_1} + \frac{V}{R_2} \right) \cdot R_G = V$$

$$R_G = \frac{V}{\frac{V}{R_1} + \frac{V}{R_2}}$$

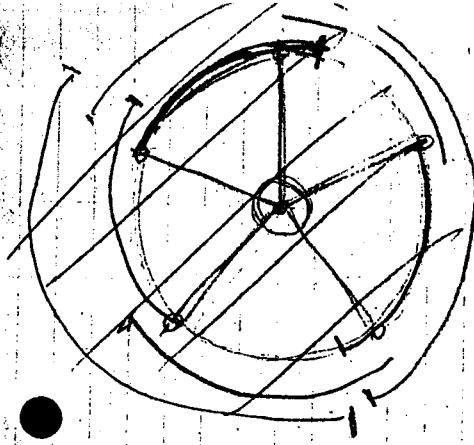
$$\cancel{V} \cancel{\frac{1}{R_1}} \cancel{\frac{1}{R_2}} \cdot \frac{1}{R_1 + R_2}$$

$$\cancel{\left(\frac{1}{R_1} + \frac{1}{R_2} \right)} \cdot R_G = 1$$

$$R_G = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2}} = \frac{R_1 \cdot R_2}{R_1 + R_2}$$

$$\lim_{R \rightarrow \infty} \left(\frac{R_1 \cdot R_2}{R_1 + R_2} \right) = R_1$$

$$\frac{1}{\frac{1}{R_1} + \frac{1}{R_2}}$$



W "22 n 22"

K_{0,3}(x)

* CW & MP 180°

x 1 2x3D 8, 2

~~8, 2~~

K_{1(x)} = 8, K_{2(y)} = 2

W. b. G. v. v. v. v. v.

21 120 J 9 6 A. v. v. v. v.

S. M. G. S. C. v. v. v. v. v.

... 100 60 - 04 9.6 8.

- 16 " 6 ingra f " 3 P. 6 0

190.000.000 121.8

$E_{\text{ext}} \text{ Agr.}(x) = P(x)$

$x = 630$ m. Agr. $\sim 10^6$

(B) $\omega = 6$ Agr. $\rightarrow 6x^{84} \text{ sec}^{64}$
 $\rightarrow 6 \text{ Agr. sec}^2$

Agr(x) $\sim 630 \text{ sec}^2$

$$\text{Agr}(x) = P = n \times 2 \times (4d + 2.8d) \\ = n \times 20d.$$

1.6×10^6) $\text{Agr} \sim 10^6$

$K \text{ Agr}(x) \sim n \cdot b \text{ Agr.}$

$K \text{ Agr}(x) = a \cdot a \text{ fult. } l \sim n$

$K_1(a) = K_0 \cdot K \text{ Agr}(x) =$

$$(g = 000) \vee (g = 001) = \alpha (g = (000 \vee 001))$$

left: 4' 10" right: 4' 10"

4' 2"

4' 2" 10" 4' 10"

21' 1" 2' 6" 4' 10"

4' 2" 4' 10"

4' 2" P.D.

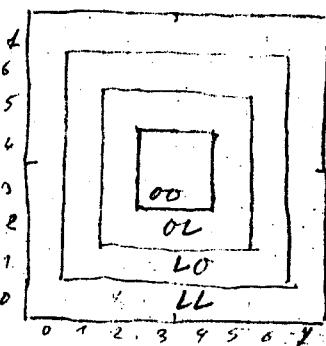


area of the trapezoid:

area of the trapezoid:

area = $2 \times 3 D$

K1(X) = area of the trapezoid



$\sim \text{LL} : \xi_1, \eta_1$

$\sim \text{LO} : \xi_2, \xi_1, \xi_0, \eta_2, \eta_1, \eta_0$

$\sim \text{OL} : (\xi = \text{OOL} \vee \text{LOL}) \wedge (\eta = \text{OOL} \vee \text{LLO})$

$\sim \text{OO} : (\xi = \text{OOO} \wedge \text{OOI} \wedge \text{OOL}) \wedge (\eta = \text{OOO} \wedge \text{OOL} \wedge \text{LOL})$
 ~~$\wedge (\xi = \text{OOO} \wedge \text{OOL} \wedge \text{OLI}) \wedge (\eta = \text{OOO} \wedge \text{OLI} \wedge \text{LLO})$~~

$\sim \text{OO} : (\xi = \text{OOO} \wedge \text{OOL} \wedge \text{OLI}) \wedge (\eta = \text{OOO} \wedge \text{OLI} \wedge \text{LLO})$

~~$\wedge (\xi = \text{OOL} \wedge \text{OLI}) \wedge (\eta = \text{OOL} \wedge \text{OLI})$~~

$\sim \text{LL} : (\xi = \text{LLL} \vee \text{LLI}) \wedge (\eta = \text{LLL} \vee \text{LLI})$

$$(Z_{\text{an}}(x) = \infty) \sim (\varrho = 0 \text{ or } v \neq 0) \wedge (\eta = 0 \text{ or } v \neq 0).$$

$$(Z_{\text{an}}(x) = 0) \sim \left[\begin{array}{l} (\varrho = 0 \text{ or } v \neq 0) \wedge (\eta = 0 \text{ or } v \neq 0) \\ \vee [(\eta = 0 \text{ or } v \neq 0) \wedge (\varrho = 0 \text{ or } v \neq 0)] \end{array} \right]$$

$$(Z_{\text{an}}(x) = 10) \sim [(\varrho = 0 \text{ or } v \neq 0) \wedge (\eta = 0 \text{ or } v \neq 0)]$$

$$\vee [(\eta = 0 \text{ or } v \neq 0) \wedge (\varrho = 0 \text{ or } v \neq 0)]$$

$$(Z_{\text{an}}(x) = 44) \sim (\varrho = 0 \text{ or } v \neq 0) \vee (\eta = 0 \text{ or } v \neq 0).$$

$$L^2 \times \sqrt{\lambda_2}$$

$$\cancel{L^2} \cap Z_{\text{an}}(x) \quad \{y\} \subset Z_{\text{an}}(x).$$

$$1) y \sim \text{Lat} : \text{Quadrat}(x).$$

02	44
00	40

$$(\text{Quadrat}(x) = 00) \sim (\varrho_2 = 0 \wedge \eta_2 = 0)$$

$$(\text{Quadrat}(x) = 02) \sim (\varrho_2 = 0 \wedge \eta_2 = 1)$$

$$(\text{Quadrat}(x) = 40) \sim (\varrho_2 = 1 \wedge \eta_2 = 0)$$

$$(\text{Quadrat}(x) = 44) \sim (\varrho_2 = 1 \wedge \eta_2 = 1)$$

$$k_1(\text{Quadrat}(x)) = \varphi_1 + \eta_1$$

$$k_2(\text{Quadrat}(x)) = \varphi_2 + \eta_2.$$

$$\varphi_1 \sim \varphi_2, \quad \eta_1 \sim \eta_2.$$

$$\text{Quadrat}(x) \sim (\varphi_2, \eta_2)$$

$\text{Pos}(x; y) \vdash x \in \text{dom}(f)$

$$y: (\text{Quadr}(x) = 0\alpha) \rightarrow (y = 0\alpha, 0\alpha)$$

$$(\text{Quadr}(x) = 01) \rightarrow (y = 01, 100)$$

$$(\text{Quadr}(x) = 10) \rightarrow (y = 100, 0\alpha)$$

$$(\text{Quadr}(x) = 11) \rightarrow (y = 100, 100)$$

$$\text{Quadr}(x) = g_2, y.$$

$$k(g_2) \rightarrow (u = 0) \rightarrow k(u) = 0\alpha$$

$$(u = 1) \rightarrow k(u) = 100.$$

$$y(\text{Quadr}(x)) = (g_2, \bar{g}_2, \bar{g}_2, \eta_2, \bar{\eta}_2)$$

($x \in \text{dom}(f) \wedge y \in \text{dom}(f) \wedge \dots$)

$$\text{Pos}(x; y) = \varphi(Ag(x; y), Ag(y; y)).$$

$$Ag(x; y) = g(x) - g(y)$$

$$Ag(y; y) = 2g(y) - g(y).$$

$$g(x) \neq a \quad | \quad a + 3D \quad | \quad a - b: a_2, a_1, a_0$$

$$g(y) = b \quad | \quad b + 3D \quad | \quad a_2, a_1, a_0$$

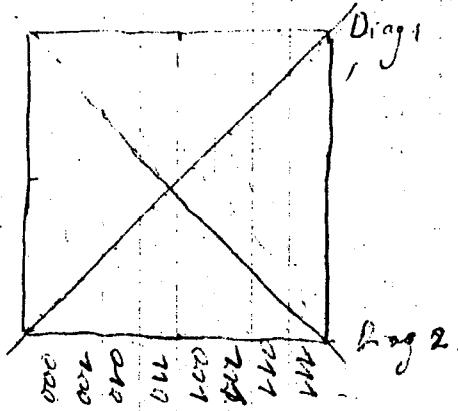
$$a - b: P \quad 1+3D. \quad [P^2 - \partial_{\lambda} \log \mu]$$

$f_{\text{om}}(x) =$

$$|\Delta g(x, y)| > |\Delta \bar{g}(x, y)| \rightarrow f_{\text{om}}(x) = |\Delta g(x, y)|$$

$$|\Delta g(x, y)| > |\Delta \bar{g}(x, y)| \rightarrow f_{\text{om}}(x) = |\Delta \bar{g}(x, y)|$$

L.C.:



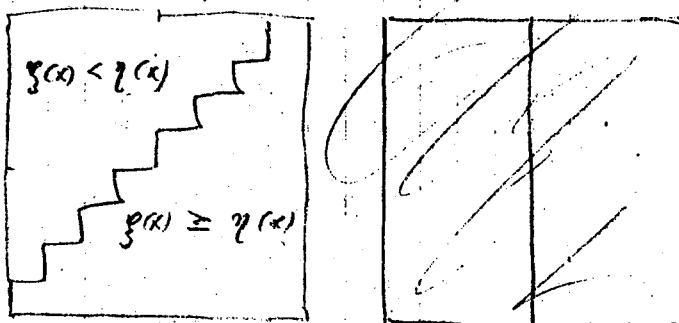
With constraint 1: $\bar{g} = g$.

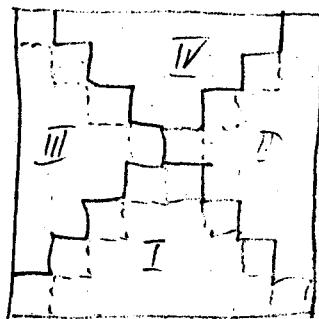
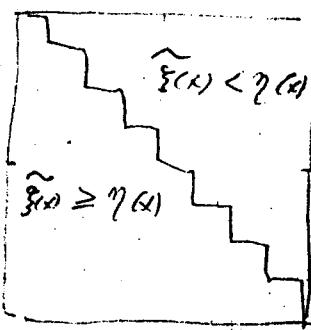
" " " 2: $\bar{g} = \text{Supl.}(g)$.

~~Supl. (g)~~ ~~if~~ \Rightarrow

~~($s = \text{Supl.}(g)$)~~ \rightarrow ~~($\forall i$)~~ $(\eta_i, s_i) (s_i \sim \bar{\eta}_i)$

$\text{Supl}(g) = \text{Af } \bar{g}$.





$$I_1 \left(f(x) \geq g(x) \right) / \lambda \left(f(x) \geq g(x) \right)$$

II
III
IV

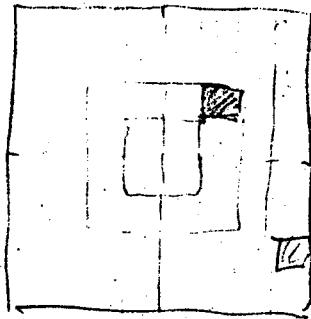
III
IV

III
IV

III
IV

20. C. 2f.

Pen & Ink - ✓



- 1) $\sqrt{xy} = \sqrt{x}\sqrt{y}$
 - 2) $\sqrt{xy} = \sqrt{x}\sqrt{y} = \sqrt{3}$
 - 3) $\sqrt{a^2 + b^2} = \sqrt{a^2} + \sqrt{b^2}$
 - 4) $\sqrt{a^2 + b^2} = \sqrt{a^2} + \sqrt{b^2}$

~~80
8 x 6 ft. 2
10~~

< ye ver 26

\rightarrow L. Cat. O. o. G. Ziff. m.
and O. be an even function.
y.e. $f(x) = f(-x)$ for all x.

$$\text{Par}(x, y) = \text{Orth}$$

$$\text{Orth}(x, y) \sim (f(x) = f(y)) \vee (g(x) = g(y))$$

$$K : 6^M : A : P : 3 \times 2 \times 3 D.$$

$$\therefore K_1(A) = C^{6^M} \circ C^{3^2} \quad v^d = x_1$$

$$K_2(A) = C^{6^M} \circ C^{3^2} \quad v^d = x_2$$

$$K_3(A) = C^{6^M} \circ C^{3^2} \quad v^d = x_3$$

$$1.) \text{Zon}(x_1) = \emptyset$$

$$2.) \text{Zon}(x_2) = \emptyset$$

$$3.) \text{Orth}(x_1, x_2)$$

$$4.) \cancel{(f(x_1) = f(x_3)) \vee (g(x_1) = g(x_3))}$$

$$\text{Orth}(x_2, x_3) \wedge \text{Orth}(x_1, x_3)$$

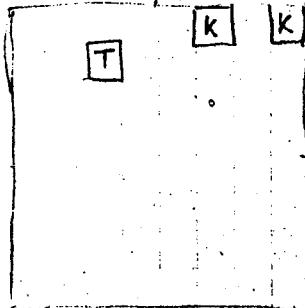
$$5.) \overline{\text{Bem}}(x_2, x_3).$$

?/10)

$$\begin{aligned} & f_{\text{out}}(x_1) = \text{ok} \wedge f_{\text{out}}(x_2) = \text{Lb} \wedge \text{Orth}(x_1, x_2) \\ & \wedge \text{Orth}(x_2, x_3) \wedge \text{Orth}(x_1, x_3) \wedge \text{Bent}(x_2, x_3) \end{aligned}$$

(4.6.1)

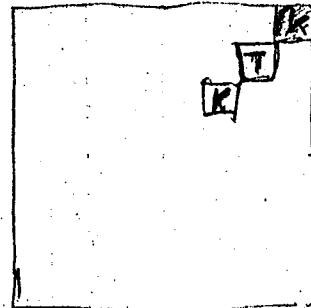
6'51



$$\text{Eck}(x_2) \wedge \text{Orth}(x_1, x_2) \wedge (\text{Bent.}(x_1, x_2) = \text{Lb})$$

$$\begin{aligned} & \text{Eck}(x_2) \wedge [(\Delta g(x_1, x_2)) = 0 \wedge \Delta \eta(x_1, x_2) = 0] \wedge \\ & (\Delta g(x_1, x_3)) = L \vee (\Delta \eta(x_1, x_2) = 0 \wedge \Delta g(x_1, x_2) = 0) \\ & \wedge (\Delta \eta(x_1, x_3)) = L \wedge \text{Orth}(x_2, x_3) \end{aligned}$$

P (4.6.51)



$\text{Eck}(x_2) \wedge \text{Dra}(x_1, x_2, x_3) \wedge$

$\text{Ben}(x_2, x_3) \wedge \text{Ban}(x_2, x_3)$

$\rightarrow \text{C}_2:$

$E(z) (\text{Ben}(x_2, z) \wedge$

$(z) (\text{Ben}(x_2, z) \wedge (\text{Ben}(x_1, z) \vee \text{Orth}(x_3, z)))$

$\wedge (\text{Ben}(x_2, x_3) \rightarrow \text{Ben}(x_1, x_3))$

$\rightarrow \text{C}_2 \text{ C. } 6^{\text{th}} \text{ of 14}$

$\rightarrow \text{C}_2: \text{if } S \in \mathcal{L} \text{ then } S \in \mathcal{M}$

$C^2, \mathcal{L}, S, ?$

$\text{far}(x, y, z), \quad y \neq z \wedge x = z$

$(x, y, z) \sim \text{far}(x, y, z) \vee \text{Dag}(x, y, z)$

$(x, y, z) \sim [S(x) = S(y) = S(z) \wedge (\eta(x) < \eta(y) < \eta(z) \vee$

$\eta(z) > \eta(y) > \eta(x))] \vee \dots$

$\dots \sim \text{far}(x, y, z) \wedge \#(x, y, z) \neq 3 \rightarrow$

$(S(x), S(y), S(z)) \wedge \text{far}(\eta(x), \eta(y), \eta(z))$

$y \neq z \sim \text{Orth}(y) \vee \text{Dag}(y)$

CDW gr = 64 C.

W₁, W₂,
W₃ and P₁, P₂

Board(x) = {g, q} + 2x3D.

1) Will S. and G.

N		g(x)		q(x)	
W ₁	W ₂	00	01	02	03
10	11				

2) Will S. and G. N. S. O. W.

Horoth(x) x N = 0 or 25

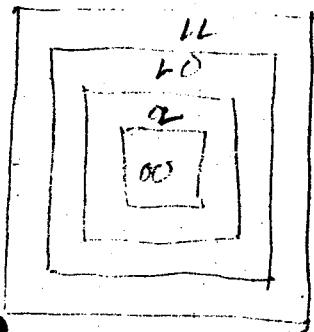
Gidh(x) x N = 0 or 25

Osth(x) x N = 0 or 25

Woth(x) x N = 0 or 25

Quade(x) = 00 x N = 0 or 25

00	01	02	03
10	11	12	13



$$f_{\text{out}}(x) = \begin{pmatrix} 00 \\ 01 \\ 10 \\ 11 \end{pmatrix}$$



$$\text{Holiag}(x) \sim g(x) = \eta(x)$$

$$\text{Holiag}(x) \sim \tilde{g}(x) = \eta(x)$$

$\text{Holiag}(x) \neq \text{Holiag} \vee \text{Holiag}(x)$

$Eck(x) \sim f_{\text{out}}(x) = 11 \wedge \text{Holiag}(x)$.

$$\text{Farb}(x) = + \quad x \cdot c$$

$$" \quad = - \quad x \cdot jy$$

2.) - 2. yR S. L. L. L.

gfarb. (x, y) $\rightarrow y \neq 7$ Cu .

Nord (x, y)

Grd (x, y)

Ost (x, y)

West (x, y)

Quord (x, y)

Qgrid (x, y)

Qost (x, y)

Qwest (x, y)

NO (x, y)

SO (x, y)

EW (x, y)

QNO (x, y)

QSO (x, y)

QEW (x, y)

QNEW (x, y)

Zon (a) $>$ Zon (b) \rightarrow NWB ($y \neq 0$)

Nochmae (a)

en \neq L.

Zon max (a)

Ag (x, y) = "y"

NS (a)

Zon (x) $>$ Zon (y)

\rightarrow Zon (x) = Zon (y)

$\text{Orth}(x, y, z \dots)$ x, y, z 非直角の時
 $\text{Dag}(x, y, z \dots)$ x, y, z 直角の時.

$$\text{Orth}(x, y) \sim g(x) = g(y)$$

$$\text{Orth}(x, y) \sim \eta(x) = \eta(y)$$

$$\text{Dag}(x, y) \sim \Delta g(x, y) = \Delta g(y, x)$$

$$\text{Dag}(x, y) \sim \Delta g(x, y) - \Delta g(y, x)$$

$$g_{xz}(x, y) \sim \text{Orth}(x, y) \vee \text{Dag}(x, y),$$

$$g_{yz}(x, y, z) \sim y \wedge x \perp z.$$

$$g_{xy}(x, y) \sim x \perp y \text{ 且み}.$$

$$\text{Ben}(x, y) \sim x \perp y \sim \text{D.S.}$$

$$\text{Wbst}(x, y) \sim \text{Ben}(x, y) \wedge \text{Gord}(y, x)$$

$$\text{Gbst}(x, y) \sim \text{Ben}(x, y) \wedge \text{Gord}(y, x)$$

$$\text{Wbst}(x, y) \sim \text{Ben}(x, y) \wedge \text{Dag}(x, y) \wedge \text{Gord}(y, x)$$

$$\text{Gbst}(x, y) \sim \text{Ben}(x, y) \wedge \text{Dag}(x, y) \wedge \text{Gord}(y, x).$$

$$\vdash (a \rightarrow c \wedge b \rightarrow c) \rightarrow (a \vee b \rightarrow c)$$

$$a \wedge b \rightarrow a \vee b$$

$$(a \rightarrow c \wedge b \rightarrow c) \rightarrow (a \wedge b \rightarrow c)$$

$$a \wedge b \rightarrow a \vee b$$

$$\text{LC}^\sim : \alpha \rightarrow \beta \sim \bar{\alpha} \vee \beta$$

$$\overline{a \wedge b} \vee a \vee b$$

$$\overline{\bar{a} \vee \bar{b}} \vee a \vee b \sim a \bar{a} \vee \bar{a} b \vee \bar{b} a \vee b \sim + +$$

$$a \rightarrow c \wedge b \rightarrow c$$

$$\bar{a} \vee c \wedge \bar{b} \vee c \sim c \vee (\bar{a} \wedge \bar{b})$$

$$(a \wedge c) \vee (\bar{a} \wedge c) \vee (\bar{a} \wedge \bar{b}) \wedge (b \wedge c) \vee (\bar{b} \wedge c) \vee (\bar{b} \wedge \bar{c})$$

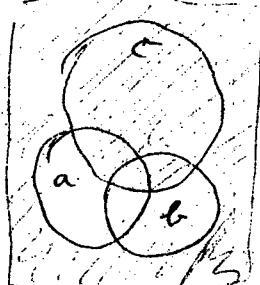
~~$a \wedge c \vee \bar{a} \wedge c \vee \bar{a} \wedge \bar{b} \wedge b \wedge c \vee \bar{b} \wedge c \vee \bar{b} \wedge \bar{c}$~~

$$c \vee (\bar{a} \wedge \bar{b}) \sim (a \vee b) \rightarrow c$$

$$\vdash (a \rightarrow c) \wedge (b \rightarrow c) \sim a \vee b \rightarrow c$$

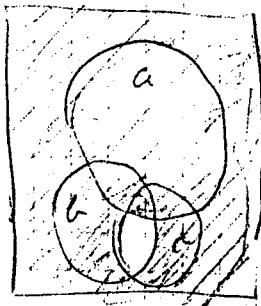
~~$\frac{a \rightarrow c}{\vdash a \rightarrow c}$~~

~ L



a	b	c	F ₁	F ₂
-	-	-	-	+
-	+	-	+	+
-	+	+	-	-
+	-	-	+	+
+	+	-	-	+
+	+	+	+	-
+	+	+	+	+

$\sim(a \wedge b) \rightarrow c$



a	b	c	F ₁	F ₂
-	-	-	+	+
-	-	+	+	F
-	+	-	+	+
-	+	+	+	+
+	-	-	+	+
+	-	+	+	+
+	+	-	-	-
+	+	+	+	+

$$[(a \vee b) \rightarrow c] \rightarrow [(\bar{a} \wedge b) \rightarrow c]$$

$$(\overline{a \vee b} \vee c) \rightarrow (\bar{a} \wedge b \vee c)$$

$$\overline{a \vee b \vee c} \vee \overline{\bar{a} \wedge b \vee c}$$

$$(a \vee b \wedge \bar{c}) \vee (\bar{a} \vee \bar{b} \vee c)$$

$$(a \wedge \bar{c}) \vee (\bar{b} \wedge \bar{c}) \vee \bar{a} \vee b \vee c$$

$$\cancel{c \wedge \bar{a} \wedge (\bar{b} \wedge \bar{c})}$$

$$(a \wedge \bar{c}) \vee (\bar{b} \wedge \bar{c}) \vee \cancel{c}$$

Ch. 10. (M)

6.6.5. Let $x \in D$.
 y_1, y_2 from the f.g. of D
such that $x = y_1 + y_2$.

if $y_1 = 0$, then y_2 is f.g.
and $x = y_2$ is f.g.

$$a+b=c.$$

$$a+b \rightarrow c.$$

$(x)(\exists a, b, g) \wedge fag(x, y) \rightarrow a$.

Now take x with D f.g.

\checkmark \rightarrow f.g. of C & B f.g.

\checkmark \rightarrow a is f.g. of C .

$$A \rightarrow \text{f.g.}(x) = u.$$

e.g. x is f.g. in C/A f.g.

\checkmark \rightarrow S is f.g.