Note some theorems were moved, so the numbering below may be wrong (theorem 4.71 was inserted).

Definition 2.29: Removed erroneous notation $\min X$ and $\max X$ for minimal and maximal elements of a poset.

Definition 2.35: $\sup 
\rightarrow \inf$.

Proposition 2.59: $\cup \rightarrow \sqcup$.

Definition 2.69: infinitely $\rightarrow$ infinite.

Theorem 2.76: $a \rightarrow an$, infinitely $\rightarrow$ infinite.

Definition 2.93: meet $\rightarrow$ join.

Theorem 2.102: Messed lower and upper adjoints.

Proof of theorem 2.103: $y \rightarrow x$; messed lower and upper adjoints.

Section title: Co-Brouwerian lattices $\rightarrow$ Co-Brouwerian lattices.

Theorem 2.122: $\subseteq \rightarrow \sqsubseteq$.

Theorem 3.6: Added the word “monotone”.

Proof of proposition 3.9: $\notin \rightarrow \in$.

Theorem 3.14: multiple errors in formulas.

New proposition 3.15: Every boolean lattice is separable.

Definition 3.44: Added words “with the same source and destination”.

After definition 3.55: Added forgotten “entirely defined, injective, and surjective”.

Proof of lemma 3.87: $\text{dom } F \rightarrow \{i\}$.

Proof of lemma 3.88: More detailed proof.

Proof of lemma 3.90: More detailed proof.

Proof of lemma 3.91: More detailed proof.

Definition 4.7: $\mathfrak{A} \rightarrow \mathfrak{Z}$.

Definitions 4.13 and 4.14: Added words “for an element $a$ of a filtrator” for clarity.

4.2.6 Atomic Filter Objects $\rightarrow$ Atomic Elements of a Filtrator.


Proposition 4.51: Strengthened: distributive lattice $\rightarrow$ starrish join-semilattice.

Proof of theorem 4.58: 1. $\bigcap \rightarrow \bigcap$; 2. Added words “by the assumption of induction”; 3. $\text{card } A \rightarrow \text{card } T$.

Theorem 4.69 and its proof: $\mathfrak{P} \rightarrow \mathfrak{Z}$. Also: $\mathfrak{A} \rightarrow \mathfrak{Z}$.

Theorem 4.70: Strengthened: distributive $\rightarrow$ starrish.

Definition 4.71: $\mathfrak{A} \rightarrow \mathfrak{Z}$.

Corollary 4.91: “join-closed” $\rightarrow$ “with join closed core”.

Proposition 4.94 and theorem 4.71 are now separated into two distinct statements.

Theorem 4.99: Removed superfluous theorem conditions. Rewritten the proof.

Theorem 4.112 and 4.72 are now separated into two distinct statements.

Lemmas 4.115 and 4.73 are now separated into two distinct statements.

Proof of theorem 4.137: Last paragraph modified.

Proposition 4.140: Added the word “distributive”.

Theorem 4.142: Strenghtened: atomistic $\rightarrow$ atomic.

Proof of theorem 4.144: 1. $\mathcal{X} \rightarrow \text{up} \mathcal{X}$. 2. proof clarified.

Proof of theorem 4.150: Added: “Core part and dual core part are defined because the core is a complete lattice.”

Proof of proposition 4.159: $= \rightarrow \sim$.

Proof of proposition 4.161: $\mathfrak{A} \rightarrow \mathfrak{Z}$.

Proposition 4.178: $\max a \rightarrow \max \text{down} a$.

Proposition 4.184: Removed $S \in \mathcal{P}\mathcal{S} \setminus \{\emptyset\}$.

Proof of lemma 4.231: Removed “$X$”.

Corollary 3.232: $\mathcal{G} \rightarrow \mathcal{A}$.

Proof of theorem 4.233: $X \rightarrow \text{card} X$.

Proof of example 4.235: $\uparrow x = \{a, 1\} \rightarrow \text{up} x = \{x, a, 1\}$.


Proposition 5.14: “$\in a$” removed.

Proposition 5.21: $\Delta \rightarrow \partial \Delta$.

Proof of proposition 5.33: $X \rightarrow U$.

6.1 Informal introduction into funcoids: $\alpha \rightarrow \beta$.

Proposition 6.13: Strenghtened (removed the word “small”).

Proof of proposition 6.16: $\beta_1 \rightarrow \beta_2$.

Proof of theorem 6.27: 1. $Y \in \mathcal{P}B \rightarrow X \in \mathcal{P}A$. 2. $a' \rightarrow \alpha'$.

Theorem 6.31: funcoids $\rightarrow$ funcoid.

Proof of lemma 6.33: $B \in \langle F \rangle X \rightarrow B \in \langle \uparrow_{\text{FCD}}(\text{Src} f; \text{Dest} f)F_B \rangle X$.

Proof of lemma 6.34: $X \rightarrow X$.

Proof of theorem 6.36: Refer to a less general proposition (4.189).

Added remark 6.40.

Before theorem 6.42: $f \rightarrow g$.

Proof of theorem 6.60: corollary 4.126 $\rightarrow$ proposition 4.197.

Theorem 6.61: $A \rightarrow B$.

Proof of theorem 6.61: 1. $\alpha' \rightarrow \alpha$. 2. $\sqcup \rightarrow \sqcup$. 3. $A \rightarrow B$.

Proposition 6.67: $= \rightarrow \sqsubseteq$.

Proof of theorem 6.74: Forgotten $X$.

Proof of theorem 6.96: $Y \rightarrow \uparrow^B Y$.

Proof of theorem 6.111: $f \rightarrow g$.
Definition 7.27: $f \to \text{GR } f$.

Proof of theorem 7.30: 1. Added missing “GR”. 2. $\cap \to \cap$.

Proof of theorem 7.35: $f \to \text{GR } f$.

7.5 Categories of reloids: $(f; A; B) \to (A; B; f)$.

7.6 Monovalued and injective reloids: $\text{funcoid } \to \text{reloid}$.

Definition 7.41: $A \to B$.

Theorems 6.102, 7.43: Removed $\exists \alpha \in \text{Src } f$.

Proof of theorem 7.58: $f \to F$.

Lemma 8.4 and its proof: $\text{Dst } f \to V$.

Theorem 8.6: Added GR.

Proof of theorem 8.9: 1. $A \times^{\text{RLD}} B \to (\text{FCD})(A \times^{\text{RLD}} B)$ Removed $\forall$.

Proof of proposition 8.10: $i \to i$.

Proof of theorem 8.17: 1. $\bigcup \to \bigcup$. 2. Proof clarified.

Proof of theorem 8.18: $A \to X$.

Conjecture 8.27: $a \to A$, $b \to B$.

9.1.1 Pretopology: The section completely rewritten (and much shortened), multiple errors corrected.

9.1.2 Proximity spaces: $(\sim) \to (\sim)^*$ in several places.

9.1.3 Uniform spaces: $\nu \to \mu$ several times.

9.2: $f^{-1} \to f^!$.

Theorem 9.5: Added “of a partially ordered dagger precategory”.

Proof of theorem 9.7: $I_A \to f|_A$.

Proposition 10.25: $X \cup Y \to X \cup Y = A$.

Theorem 10.12: relation $\to$ binary relation.


Proof of proposition 11.5: Removed “up”.

Lemma 11.7: filter $\to$ filters.

Proposition 11.24 and its proof: $A \to B$.

Theorem 11.35: isomorphism $\to$ being isomorphic.

Proof of theorem 11.41: $\text{dom } f \to 1^{\flat}(\text{Base}(A))$.

Proof of theorem 11.45: $\text{up } B \to B$.

Proof of proposition 11.46: $\subseteq \to \subseteq$.

Proof of proposition 11.47: Several errors.

Proof of theorem 11.58: 1. $(f; \text{Base}(a); \text{Base}(a)) \to F$. 2. $\text{up } a \to a$. 3. $\geq \to \supseteq$.

11.3 Rudin-Keisler equivalence and Rudin-Keisler order: two examples $\to$ example.
Lemma 11.62 and its proof: \( \uparrow \text{FCD}(\text{Dst } f_0; \text{Dst } f_1) f \rightarrow \uparrow \text{FCD}(\text{Src } f_0 \times \text{Src } f_1; \text{Dst } f_0 \times \text{Dst } f_1) f \rightarrow \uparrow \text{Dst } f_0 \times \text{Dst } f_1 \).


Theorem 11.76 and its proof: reloid \( \rightarrow \) graph of reloid.

Proof of theorem 11.77: Added GR.

Proof of theorem 11.78: Wording and formulas corrected.

Proof of theorem 11.87: Wording corrected.

Proof of example 11.84: \( \langle f \rangle \rightarrow \langle \uparrow \text{FCD} f \rangle \), \( \langle g \rangle \rightarrow \langle \uparrow \text{FCD} g \rangle \).

Example 12.2: Added \( \uparrow \mathbb{R} \).

Proof of example 12.3: \( \mathbb{R} \rightarrow 1_{\mathbb{R}} \).

Proposition 12.8 and its proof: Strengthened: \( N \) replaced with an arbitrary infinite set.

Proof of proposition 12.19: 1. \( \{(x) \times N\} \cap \omega = \emptyset \rightarrow \uparrow N \times N(\{x\} \times N) \cap \omega = 0 \times (N \times N) \); 2. \( \subseteq \to \equiv \).

Proof of example 12.26: \( K = (\geq) |_{\mathbb{R} \times \mathbb{R}} \rightarrow K = (\leq) |_{\mathbb{R} \times \mathbb{R}} \); 2. \( \uparrow \text{FCD}(\text{Base}(A);\text{Base}(B)) \rightarrow \uparrow \text{FCD}(\text{Base}(A);\text{Base}(B)) \).

Proof of example 12.30: Refered to an other example.

Proof of proposition 13.14: \( \mathfrak{A} \rightarrow \text{Dst } f \).

Proof of theorem 13.15: \( \mathfrak{A} \rightarrow \text{Dst } f \).

Proof of proposition 12.23: \( \text{up} \rightarrow \text{up}^{(\text{Dst } f,3)} \).

Theorem 13.25: Added “which is a meet-semilattice and \( \forall x \in \text{Src } f: \text{up}^{(\text{Src } f;3) x} \neq \emptyset \)”.

Proof of theorem 13.25: 1. proposition 4.96 \( \rightarrow \) theorem 4.44; 2. Added “because Dst f is separable by obvious 4.134”.

Proof of theorem 13.26: \( \emptyset \to 0^B \).

Theorem 13.27: “element” removed.

Proof of theorem 13.27: Added “because Dst f is separable by obvious 4.134”.

Proof of theorem 13.27: 1. Added “\( \text{up } x \neq \emptyset \) is obvious”. 2. Added “First the meets \( \prod^{\text{Src } f} S \) and \( \prod^{\text{Dst } f} (\langle f \rangle) S \) exist by corollary 4.105”. 3. Added “(because Dst f is a separable poset)”.

Proof of theorem 13.31: 1. Added “\( \text{FCD}(\mathfrak{A};\mathfrak{B}) \) is a poset because \( \mathfrak{A} \) and \( \mathfrak{B} \) are separable.” 2. \( \cup \rightarrow \sqcup \), \( \exists \to \exists \), \( \bigcup^B \to \bigcup \).

Proof of proposition 13.32: Added “and corollary 13.24”.

Theorem 13.33: Added “separable”.

Proof of theorem 13.33: 1. Added “\( \text{FCD}(\mathfrak{A};\mathfrak{B}) \) is a poset because \( \mathfrak{A} \) and \( \mathfrak{B} \) are separable.”

Theorem 13.37: Added “separable”.

Proof of theorem 13.37: Added “(using separability of Dst f)”.

Theorem 13.38: Added “and separable”, “posets” \( \rightarrow \) “separable starrish join-semilattice”.

Proof of theorem 13.38: 1. Added “We can apply theorem 13.33”. 2. Added “Thus \( f \circ (g \sqcup h) = f \circ g \sqcup f \circ h \) by theorem 13.30”.

Obvious 13.42, 13.33: \( A \to a \).
13.6 Domain and range of a pointfree funcoid: The definition and properties of funcoid image (and domain) are rewritten.

13.7 Category of pointfree funcoids: $\mathcal{FCD}(A) \to \text{id}_{\mathcal{FCD}(A)}$

Theorem 13.59 and its proof: 1. $\subseteq \to \sqsubseteq$; 2. up $\to \text{up}(\alpha, 3_0)$.

Proof of proposition 13.64: More detailed proof.

Proof of proposition 13.65: $\subseteq \to \sqsubseteq$.

Proposition 13.72: meet-semilattice $\to$ meet-semilattice with least element.


Proof of theorem 13.75: $B \to \mathcal{FCD}(A; B)$.

Proposition 13.79: $\bigsqcup \to \sqcup$.

Proof of proposition 13.80: $\sqcup \to \bigsqcup$.

Theorem 13.88: $\langle f \rangle Z_0 S \to \langle f \rangle \sqcap Z_0 S$.

Proof of theorem 13.88: Replaced a wrong formula reference with a true formula.

Theorem 13.89: Added “atomic”.

Theorem 13.89 and its proof: Removed superfluous conditions.

Proposition 13.91: Removed unnecessary condition “and $Z_0$ is a complete boolean lattice”.

Definition 13.92: Added “atomistic”.

Obvious 13.95: Turned into a proposition and added a proof.

Obvious 13.98: Removed as wrong in the case if our posets are not meet-semilattices.

Thereom 13.98: Added “with least element”; added that $\mathcal{B}$ is atomic.

Proof of theorem 13.98: 1. $\cap^\mathfrak{a} \to \cap^\alpha$; 2. added more explicit proposition references; 3. $0 \to 0^\mathfrak{a}$.

Theorem 13.99: $\cap \to \sqcap$.


Theorem 13.99: $Z_0 \to Z_1$.

13.14 Elements closed regarding a pointfree funcoid: Removed superfluous “with least element”.

Proof of theorem 13.101: 1. $\subseteq \to \sqsubseteq$; 2. Added “(used separability of $\mathfrak{A}$)”.

Proposition 13.104: Added “with join-closed core”.

14.2 Limit: $\{a\} \to \uparrow^\text{Src} \mu \{a\}$; $\langle f \rangle \to \langle f \rangle^*$; $\cap \to \sqcap$; $\text{dom } f \to \text{dom } (\text{dom } f)$.

14.3 Generalized limit: “group of permutations of” $\to$ “permutation group on”.

14.3.1: $\langle \mu \rangle^* \{x\} \to \langle \mu \rangle^* \{x\}$. “We will assume that the funcoid $f$ is defined on $\langle \mu \rangle^* \{x\}$. “We will assume that the dom $f \supseteq \langle \mu \rangle^* \{x\}.”$

Proof of proposition 14.11: $\subseteq \to \sqsubseteq$.

Proof of proposition 14.20: Removed “where $x' \in D$”.

Proof of proposition 14.21: More detailed proof: $\langle \nu \rangle\langle f \rangle \langle \mu \rangle^* \{x\} \to \langle \nu \rangle \langle f \rangle \{x\}$.

Proof of theorem 14.23: $\sqsubseteq \to =$. 

Corollary 14.24: $\langle \mu \rangle \{x\} \to \langle \mu \rangle^* \{x\}$.

bijective $\to$ injective.
Lemma 15.3: Added poset \( \mathcal{C} \).

Theorem 15.8: \((\cdot)^{-1} \to (\cdot)\).

Theorem 15.9: “morphisms of a quasi-invertible category where Dst \( f \) and Dst \( g \) are filters on boolean lattices” \(\to\) “pointfree funcoids between filters on boolean lattices”.


Proposition 15.10 \(\to\) corollary 15.10: Added “Src \( f \), Dst \( f \), Src \( g \), Dst \( g \) are boolean lattices”.

Proposition 15.20. Strenghtened: lattice \(\to\) poset.

Proof of proposition 15.24: \( \bigsqcup \text{atoms} x_i \to \lambda i \in \text{dom} x: \bigsqcup \text{atoms} x_i. \)

Added corollary 15.21, which I previously referred to without proof.

Corollary 15.25: Strenghtened: “atomistic complete lattices” \(\to\) “atomistic poseets with least elements”.

Proof of proposition 15.26: \( \subseteq \to \subseteq \).

Proof of proposition 15.28: 1. “finitely join-closed” \(\to\) “join-closed”; 2. \( \cap \to \sqcap \); 3. said that joins exist. 4. Added reference to a necessary statement which was missing previously; \( \lambda \in n \to \lambda i \in n. \)

Proposition 15.33: Added a missing theorem condition. Now a proposition with a proof.

Proposition 15.34: Seriously rewritten.

Proposition 15.35: Added “with up \( x \neq \emptyset \) for every \( x \in \mathfrak{A}_i \) (for every \( i \in n \))”.

Proof of proposition 15.40: \( \prod \to \bigsqcup \).

Proposition 15.41 and its corollary: \( n \to \text{dom} \mathfrak{A} \).

Proof of proposition 15.41: \( \mathfrak{A} \to \prod \mathfrak{A} \).

Corollary 15.42: least \(\to\) greatest.

Definition 15.54: a poset relation \(\to\) anchored relation between posets.

Lemma 15.55: compleetary staroid \(\to\) graph of compleetary staroid. Also the proof is corrected.

Proposition 15.56: \( f \to \text{GR} f \).

Proposition 15.57: A \(\to\) Every.

Proof of proposition 15.57: The old proof was valid only for a special case.

Proof of proposition 15.64: 1. up \( L \to L \); 2. \( \mathcal{P} \mathfrak{A} \to \mathfrak{A} \).

Proposition 15.65 and its proof: 1. \( (\text{val} \sqcup f) \to (\text{val} \sqsubseteq f) \); 2. \( (\text{form} f) \to \mathfrak{A} \).

The section “Displacement” moved after the definition of cross-composition product.

Definition 15.70: is \(\to\) be.

Theorem 15.74: 1. Theorem conditions exchanged; \( L \in \prod \mathfrak{A} \to L \in \prod \mathfrak{A}_{\text{dom} \mathfrak{A} \setminus \{i\}} \); 2. added “of the form \( \lambda i \in \text{dom} \mathfrak{A} \) \( \to \mathfrak{A} \)”.

Proof of theorem 15.74: 1. Added “(taking into account that \( \mathfrak{A}_i \) is a boolean lattice)”; 2. Removed \(=K=\).

Definition 15.72: Added a new definition (\( \Lambda \)).

Theorem 15.75: Theorem condition rewritten.

Remark 15.79: posets \(\to\) pre-multifuncoid sketches.

Theorem 15.80: Strenghtened: distributive lattices \(\to\) starrish join-semilattices.
Theorem 15.84: Strengthened: distributive lattices $\rightarrow$ starrish join-semilattices.

Proof of theorem 15.84: Rewritten.

Theorem 15.85: $f \rightarrow F$.

Proof of theorem 15.85: 1. $B \in [f] \lor B \in [g] \rightarrow B \in [f]$ for some $f \in F$. 2. Removed “$(f \sqcup g)B \mid_{(\text{dom} A) \setminus \{k\}}$”; 3. other corrections.

Definition 15.89: $\text{GR} \left( \prod FCD(A) A \right) \rightarrow \bigcap \prod FCD(A) A \mid L$ (also in a proofs below).

Proof of proposition 15.90: 1. $L \rightarrow L \mid_{(\text{dom} A) \setminus \{k\}}$; 2. $A_k \rightarrow L_k$.

Proof of theorem 15.92: Several corrections.

Proof of theorem 15.94: $\subseteq \rightarrow \sqsubseteq$.

Conjecture 15.95: Was a theorem, but the proof was wrong. So now it is a conjecture.

Proof of theorem 15.99: a little shortened.

Remark 15.100: Removed.

Proposition 15.103: 1. a repeated two times formula removed; 2. $(\text{val} F_j) \rightarrow (\text{val} F_i)_j$; 3. added missing $K$ after $(\text{val} F_i)_j$; 4. $A \rightarrow B$; 4. $n \rightarrow \text{arity} \prod^{(D)} F; L_{c(i)} f$; 5. a little more detailed proof.

Proposition 5.108 and its proof: Errors corrected.

Definition 15.115: quasi-invertible pre-category with star-morphisms $\rightarrow$ category with star-morphisms.

Definition 15.117: category $\rightarrow$ pre-category.

Proof of correctness of definition 15.117: More detailed proof.

Proof of proposition 15.121: Rewritten (errors corrected).

Removed some stuff about abrupt categories, because abrupt categories were considered quasi-invertible in error (dagger for a star-morphisms was not defined but used).

15.9.2 General cross-composition: quasi-invertible category $\rightarrow$ quasi-invertible category with star-morphisms.

Proof of theorem 15.124: Added “The rest follows from symmetry.”

Corollary 15.125: Errors in the proof corrected.

15.9.3 Displacement: Moved below (now with errors).

Definition 15.160: The definition of discrete multireloid.

Added section 15.3.1 “Discrete staroids”.

“Displacement” subsection removed due errors which were not easy to correct.