

# Corrigenda for Mathematical Logic, Chiswell and Hodges

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- p.20: Ex. 2.4.1(c):  $b$  (not  $a$ ) unequal to 0.
- p.22: last displayed item, top right: should be  $D$ , not  $D'$ .
- p.23: Exercise 2.5.1(d) should read

$$\vdash (((\varphi \longleftrightarrow \psi) \longleftrightarrow \chi) \longrightarrow (\varphi \longrightarrow (\psi \longleftrightarrow \chi)))$$

It is not possible to do the exercise as given in the book using only the rules developed so far. For if it were, one could give a proof that

$$\vdash ((\varphi \longleftrightarrow (\psi \longleftrightarrow \chi)) \longrightarrow ((\varphi \longleftrightarrow \psi) \longrightarrow \chi))$$

and so a proof that

$$\{(\varphi \longleftrightarrow (\psi \longleftrightarrow \chi)), (\varphi \longleftrightarrow \psi)\} \vdash \chi$$

using just these rules. The method of Exercise 3.9.2 shows that this can't be done, as follows. Add to that exercise that the value of  $(p \wedge q)$  is the minimum of the values of  $p$  and of  $q$ , and the value of  $(p \longleftrightarrow q)$  is the same as that of  $((p \longrightarrow q) \wedge (q \longrightarrow p))$ . Then show that the conclusion of Exercise 3.9.2(c) remains true when the rules  $(\wedge I)$ ,  $(\wedge E)$ ,  $(\longleftrightarrow I)$  and  $(\longleftrightarrow E)$  can also be used in  $D$ .

Therefore, it suffices to find values for  $\varphi$ ,  $\psi$ ,  $\chi$  such that  $(\varphi \longleftrightarrow \psi)$  and  $(\varphi \longleftrightarrow (\psi \longleftrightarrow \chi))$  both have value 1 but  $\chi$  has value less than 1. The following values work:  $\varphi$  and  $\psi$  have value 0,  $\chi$  has value  $1/2$ .

- p.62: in Definition 3.5.1, Line 3, “identity” should be “identify”.
- p.75: Theorem 3.7.6(b) should be labelled “Replacement Theorem”.
- p.95: Exercise 3.10.1 should begin “If we kept the truth function symbols  $\longrightarrow$ ,  $\vee$  and  $\longleftrightarrow$ ”.
- p.119: Definition 5.3.9, part (a), the complexity of a formula is the height of the parsing tree with leaves labelled by terms, and the corresponding edges, removed. This truncated parsing tree should also be used in part (c).
- p.144: parts (1) and (2) of Theorem 5.8.3 are referred to as (a) and (b) in the proof.
- p.190: Definition 7.6.3, third line,  $RL(\sigma)$  should be  $LR(\sigma)$ .
- p.193: in the last sentence of the proof of the Compactness Theorem, it should be  $\Gamma' \models \perp$ , not  $\Gamma \models \perp$ .