COSC 5P05 - Cheat Sheet

1. $p_1 \circ \langle f, g \rangle = f$,
2. $p_2 \circ \langle f, g \rangle = g$,
3. $\langle p_1, p_2 \rangle = \mathrm{id}$,
4. $\langle f \circ h, g \circ h \rangle = \langle f, g \rangle \circ h$,
5. $f \times g = \langle f \circ p_1, g \circ p_2 \rangle$,
6. $\langle f \circ h, g \circ k \rangle = (f \times g) \circ \langle h, k \rangle$,
7. $(f \circ h) \times (g \circ k) = (f \times g) \circ (h \times k)$,
8. $\mathrm{id}_A \times \mathrm{id}_B = \mathrm{id}_{A \times B}$,
9. $\mathrm{eval} \circ (\Lambda(f) \times \mathrm{id}) = f$,
10. $\Lambda(\mathrm{eval}) = \mathrm{id}$,
11. $\Lambda(f \circ (g \times \mathrm{id})) = \Lambda(f) \circ g$,
12. $[\![x_i]\!]_\Delta = p_i$,
13. $[\![\lambda x : A.M]\!]_\Delta = \Lambda([\![M]\!]_{\Delta \cup \{x\}})$,
14. $[\![(M\ N)]\!]_\Delta = \mathrm{eval} \circ \langle [\![M]\!]_\Delta, [\![N]\!]_\Delta \rangle$,
15. $[\![\langle M, N \rangle]\!]_\Delta = \langle [\![M]\!]_\Delta, [\![N]\!]_\Delta \rangle$,
16. $[\![\mathrm{fst}(M)]\!]_\Delta = p_1 \circ [\![M]\!]_\Delta$,
17. $[\![\mathrm{snd}(M)]\!]_\Delta = p_2 \circ [\![M]\!]_\Delta$,
18. $[\![x]\!]_{\Delta \cup \{x\}} = p_2$,
19. $[\![M]\!]_{\Delta \cup \{x\}} = [\![M]\!]_\Delta \circ p_1$ if x is not free in M,
20. $[\![M[N/x]]\!]_\Delta = [\![M]\!]_{\Delta \cup \{x\}} \circ \langle \mathrm{id}, [\![N]\!]_\Delta \rangle$,
21. $\mathrm{Fix} = \mathrm{eval} \circ \langle \mathrm{id}, \mathrm{Fix} \rangle$,
22. $[\![\mathrm{rec}x.M]\!]_\Delta = \mathrm{Fix} \circ \Lambda([\![M]\!]_{\Delta \cup \{x\}})$.