

Continuations

$$\text{multiply} : R^* \rightarrow R \quad (1)$$

$$\text{multiply}(\langle \rangle) = 1 \quad (2)$$

$$\text{multiply}(\langle a_1, a_2, \dots, a_n \rangle) = a_1 \cdot \text{multiply}(\langle a_2, \dots, a_n \rangle) \quad \text{if } a_1 \neq 0 \quad (3)$$

$$\text{multiply}(\langle a_1, \dots, a_n \rangle) = 0 \quad \text{otherwise} \quad (4)$$

$$\text{multiplyCPS} : R^* \rightarrow R \quad (5)$$

$$\text{multiplyCPS}(\langle a_1, \dots, a_n \rangle) = \text{mult}(\langle a_1, \dots, a_n \rangle, \lambda x.x) \quad (6)$$

$$\text{mult} : R^* \times (R \rightarrow R) \rightarrow R \quad (7)$$

$$\text{mult}(\langle \rangle, k) = k(1) \quad (8)$$

$$\text{mult}(\langle a_1, a_2, \dots, a_n \rangle, k) = \text{mult}(\langle a_2, \dots, a_n \rangle, \quad (9)$$

$$\lambda x.k(a_1 \cdot x)) \quad \text{if } a_1 \neq 0 \quad (10)$$

$$\text{mult}(\langle a_1, \dots, a_n \rangle, k) = 0 \quad \text{if } a_1 = 0 \quad (11)$$

$$A^\perp = A^* \cup \{\perp\} \quad (12)$$

$$m : \text{RegExp} \times A^\perp \times (A^\perp \rightarrow A^\perp) \rightarrow A^\perp \quad (13)$$

$$m(r, \perp, k) = k(\perp) \quad (14)$$

$$m(\epsilon, \langle \rangle, k) = k(\langle \rangle) \quad (15)$$

$$m(\epsilon, \langle a_1, \dots, a_n \rangle, k) = k(\langle a_1, \dots, a_n \rangle) \quad (16)$$

$$m(a, \langle \rangle, k) = k(\perp) \quad (17)$$

$$m(a, \langle a_1, a_2, \dots, a_n \rangle, k) = k(\langle a_2, \dots, a_n \rangle) \quad \text{if } a = a_1 \quad (18)$$

$$m(a, \langle a_1, \dots, a_n \rangle, k) = k(\perp) \quad \text{if } a \neq a_1 \quad (19)$$

$$m(r_1 \cdot r_2, \langle a_1, \dots, a_n \rangle, k) = m(r_1, \langle a_1, \dots, a_n \rangle, \lambda x.m(r_2, x, k)) \quad (20)$$

$$m(r_1 + r_2, \langle a_1, \dots, a_n \rangle, k) = m(r_1, \langle a_1, \dots, a_n \rangle, \quad (21)$$

$$\lambda x.\text{if } k(x) = \langle \rangle \text{ then } \langle \rangle \text{ else } m(r_2, \langle a_1, \dots, a_n \rangle, k))$$

$$\text{match} : \text{RegExp} \times A^* \rightarrow \text{Boolean} \quad (22)$$

$$\text{match}(r, \langle a_1, \dots, a_n \rangle) = \text{true} \quad \text{if } m(r, \langle a_1, \dots, a_n \rangle, \lambda x.x) = \langle \rangle \quad (23)$$

$$\text{match}(r, \langle a_1, \dots, a_n \rangle) = \text{false} \quad \text{otherwise} \quad (24)$$