$$\langle \{\}, \{X\}, id, \{f_{\mathbf{n}}^{C}\langle (ab).X, (cd).X \rangle \approx_{?} f_{\mathbf{n}}^{C}\langle (cd)(bd)(ad).X, X \rangle \} \rangle$$

$$\langle \{\}, \{X\}, id, \{(ab).X \approx_{?} (cd)(bd)(ad).X, (ab).X \approx_{?} X\} \rangle$$

$$\langle \{\}, \{X\}, id, \{(cd).X \approx_{?} (cd)(bd)(ad).X, (ab).X \approx_{?} X\} \rangle$$

$$\langle \{\}, \{X\}, id, \{(cd).X \approx_{?} X, (ab)(ad)(bd)(cd).X \approx_{?} X\} \rangle$$

$$\langle \{\}, \{X\}, id, \{(ab).X \approx_{?} X, (cd)(ad)(bd)(cd).X \approx_{?} X\} \rangle$$

$$\langle \{a\#X, a\#X\}, \{X\}, id, \{(ab)(ad)(bd)(cd).X \approx_{?} X\} \rangle$$

$$\langle \{a\#X, c\#X, d\#X\}, \{X\}, id, \{X\}, id$$