$$N_{31}(A) = iQA_{11}^* \cdot \partial_x \Psi_{22} - iQA_{11} \cdot \partial_x \Psi_{20} - iQA_{11} \cdot \partial_x \Psi_{20}^*$$

$$- i2QA_{22} \cdot \partial_x \Psi_{11}^* + i2Q\partial_x A_{11}^* \cdot \Psi_{22} + iQ\partial_x A_{20} \cdot \Psi_{11}$$

$$+ iQ\partial_x A_{20}^* \cdot \Psi_{11} - iQ\partial_x A_{22} \cdot \Psi_{11}^* + c.c.$$

correct in code.

$$N_{30}(A) : iQA_{11} \cdot \partial_x \Psi_{21}^* + iQA_{21} \cdot \partial_x \Psi_{11}^*$$

$$+ iQ\partial_x A_{11} \cdot \Psi_{21}^* + iQ\partial_x A_{21} \cdot \Psi_{11}^* + c.c.$$