

# Solutions to Sakurai Chapter 1

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## 1.1

Start by adding and subtracting three terms to the commutation relation.

$$[AB, CD] = ABCD - CDAB \tag{1}$$

$$= ABCD - CDAB + ACBD - ACBD + CADB - CADB + ACDB - ACDB \tag{2}$$

$$= ABCD + ACBD - ACBD - ACDB - CDAB - CADB + CADB + ACDB \tag{3}$$

$$= AC, BD - ACD, B - CD, AB + CADB \tag{4}$$