Opti 503A **Solutions**

Problem 12-8) Method 1: Define $C = B \times A$. Then from Problem 3, we will have

$$[A \times (B \times A)] \cdot B = (A \times C) \cdot B = C \cdot (B \times A) = C \cdot (-A \times B) = -C \cdot (A \times B) = (A \times B) \cdot (A \times B).$$

Method 2: Use Problem 5 to write

$$[A \times (B \times A)] \cdot B = [(A \cdot A)B - (A \cdot B)A] \cdot B = (A \cdot A)(B \cdot B) - (A \cdot B)(A \cdot B)$$

$$= |A|^2 |B|^2 - |A|^2 |B|^2 \cos^2 \theta = |A|^2 |B|^2 \sin^2 \theta = |A \times B|^2 = (A \times B) \cdot (A \times B).$$