

**Solution to Problem 4)** Since, by assumption,  $AB = I$ , the product of the determinants of  $A$  and  $B$  must be equal to  $|I|$ , which is 1. Consequently, both  $A$  and  $B$  have non-zero determinants and must, therefore, be invertible. Multiplying the equation  $AB = I$  on the left-hand-side by  $A^{-1}$  yields  $A^{-1}AB = A^{-1}I$ , which reduces to  $B = A^{-1}$ . If we now multiply the latter equation on the right-hand-side by  $A$ , we will obtain  $BA = A^{-1}A = I$ . We have thus shown that, if a matrix  $B$  can be found which has the property  $AB = I$ , it is generally the case that  $BA = I$  will also hold.

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