

### 309 Worksheet 5.1

*True or False? Justify your answer:*

(1) The matrix product  $AB$  exists if  $A$  and  $B$  have the same number of rows.

True — False?

REASON:

(2) Suppose that the product of matrices  $A$  and  $B$  exists. Then the  $(i, j)$ -entry of  $AB$  is the dot product of the  $i$ th row of  $A$  with the  $j$ th column of  $B$  (writing column vectors as row vectors).

True — False?

REASON:

(3) Suppose that the product of matrices  $A$  and  $B$  exists. Then each column of  $AB$  is a linear combination of the columns of  $A$ .

True — False?

REASON:

(4) If  $BC = BD$ , then  $C = D$ .

True — False?

REASON:

(5) If  $AC = 0$ , then either  $A = 0$  or  $B = 0$ .

True — False?

REASON:

(6) If  $A$  and  $B$  are  $n \times n$  matrices, then  $(A + B)^2 = A^2 + 2AB + B^2$ .

True — False?

REASON: