

MATH 54 SUMMER 2017, QUIZ 7

Compute the following quantities or briefly explain why they are undefined.

$$A = \begin{bmatrix} 1 & -3 \\ -2 & 6 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} \quad C = \begin{bmatrix} 1 & 1 \\ 2 & 2 \end{bmatrix}$$

(a) AB

$$\begin{bmatrix} 1 & -3 \\ -2 & 6 \end{bmatrix} \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} = \begin{bmatrix} 1-12 & 2-15 & 3-18 \\ -2+24 & -4+30 & -6+36 \end{bmatrix} = \begin{bmatrix} -11 & -13 & -15 \\ 22 & 26 & 30 \end{bmatrix}$$

(b) BA

2×3 2×2

not defined because the number of columns in B is not equal to the number of rows in A

(c) A^2

$$\begin{bmatrix} 1 & -3 \\ -2 & 6 \end{bmatrix} \begin{bmatrix} 1 & -3 \\ -2 & 6 \end{bmatrix} = \begin{bmatrix} 1+6 & -3-18 \\ -2-12 & 6+36 \end{bmatrix} = \begin{bmatrix} 7 & -21 \\ -14 & 42 \end{bmatrix}$$

(d) B^2

2×3 2×3

Not defined because the number of columns of B is not equal to the number of rows in B

(e) $A+B$

Not defined because A and B are different sizes

(f) $3A - 2C$

$$3 \begin{bmatrix} 1 & -3 \\ -2 & 6 \end{bmatrix} - 2 \begin{bmatrix} 1 & 1 \\ 2 & 2 \end{bmatrix} = \begin{bmatrix} 3-2 & -9-2 \\ -6-4 & 18-4 \end{bmatrix} = \begin{bmatrix} 1 & -11 \\ -10 & 14 \end{bmatrix}$$