

Math 1300 Fall 2013
Friday September 6 2013
Exercises

1. Compute:

$$\begin{bmatrix} 8 \\ -3 \end{bmatrix} + \begin{bmatrix} 5 \\ 6 \end{bmatrix}$$

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2. Compute:

$$\begin{bmatrix} \frac{5}{6} & 10 & \frac{1}{2} \end{bmatrix} + \begin{bmatrix} \frac{2}{3} & -7 & \frac{3}{2} \end{bmatrix}$$

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3. Compute:

$$\begin{bmatrix} 1.4 & 0 & 3 \\ .5 & -1.2 & 2.5 \end{bmatrix} - \begin{bmatrix} .6 & -1 & 3 \\ .1 & .4 & 1 \end{bmatrix}$$

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4. Compute:

$$\begin{bmatrix} 1 & 0 & 0 \end{bmatrix} \begin{bmatrix} \frac{1}{2} \\ 6 \\ 2 \end{bmatrix}$$

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5. Compute:

$$\begin{bmatrix} 0 & 0 \end{bmatrix} \begin{bmatrix} 5 \\ -3 \end{bmatrix}$$

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6. Compute:

$$1.5 \begin{bmatrix} 4 & .5 \\ 0 & 1.2 \end{bmatrix}$$

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7. Determine whether the product AB is defined if you know that A is a 3×3 matrix and B is a 3×4 matrix.

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8. Determine whether the product AB is defined if you know that A is a 1×1 matrix and B is a 1×1 matrix.

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9. Determine whether the product AB is defined if you know that A is a 4×2 matrix and B is a 3×4 matrix.

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10. Compute:

$$\begin{bmatrix} 4 & -1 \\ 2 & \frac{1}{2} \end{bmatrix} \begin{bmatrix} 3 \\ 2 \end{bmatrix}$$

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11. Compute:

$$\begin{bmatrix} 0 & 0 \\ 0 & 0 \\ 0 & 0 \end{bmatrix} \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

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12. Compute:

$$\begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix} \begin{bmatrix} 3 & -2 \\ -1 & 1 \end{bmatrix}$$

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13. Compute:

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

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14. Give the system of linear equations that is equivalent to the matrix equation. Do not solve the system.

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

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15. Write the system of linear equations in matrix form. Do not solve the system.

$$\left\{ \begin{array}{rclclcl} -2x & + & 4y & - & z & = & 5 \\ x & + & 6y & + & 3z & = & -1 \\ 7x & + & & + & 4z & = & 8 \end{array} \right\}$$

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16. Determine whether the matrices A and B are inverses, where:

$$A = \begin{bmatrix} 2 & 8 & -11 \\ -1 & -5 & 7 \\ 1 & 2 & -3 \end{bmatrix}$$

and

$$B = \begin{bmatrix} 1 & 2 & 1 \\ 4 & 5 & -3 \\ 3 & 4 & -2 \end{bmatrix}.$$

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17. Two stores sell the exact same brand and style of a dresser, a nightstand, and a bookcase. Matrix A gives the retail prices (in dollars) for the items. Matrix B gives the number of each item sold at each store in one month.

$$A = \begin{array}{c} \begin{array}{ccc} \text{Dresser} & \text{Nightstand} & \text{Bookcase} \end{array} \\ \left[\begin{array}{ccc} 250 & 80 & 60 \end{array} \right] \end{array}$$

and

$$B = \begin{array}{c} \begin{array}{cc} \text{Store 1} & \text{Store 2} \end{array} \\ \left[\begin{array}{cc} 40 & 35 \\ 30 & 35 \\ 50 & 75 \end{array} \right] \end{array}$$

(a) Calculate AB .

(b) Interpret the entries of AB .

(c) Calculate the matrix $1.1A$.

(d) Interpret the entries of the matrix $1.1A$.

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18. A company makes DVD players and a company makes DVD players and TV sets. Each DVD player requires 3 hours of assembly, and $\frac{1}{2}$ hour of packaging, while each TV requires 5 hours of assembly and 1 hour of packaging.
- (a) Write a matrix T representing the required time for assembly and packaging of DVD players and TV set.
- (b) The company receives an order from a retail outlet for 30 DVD players and 20 TV sets. Find a matrix S so that either ST or TS gives the total assembly time and the total packaging time required to fill the order. What is the total assembly time? What is the total packaging time?