Student: Benjamin Hess	**Instructor:** Benjamin Hess	**Assignment:** Summer Assignment
Date: 5/20/11	**Course:** Linear Algebra	
Time: 10:50 AM	**Book:** Lay: Linear Algebra and Its Applications, 3e Update	

1. Solve the system of equations.

$$\begin{aligned} x_1 + 3x_2 + 2x_3 &= 11 \\ 4x_2 + 9x_3 &= -12 \\ x_3 &= -4 \end{aligned}$$

A. $(1,6,-4)$

B. $(1,-4,6)$

C. $(-4,6,1)$

D. $(6,1,-4)$

2. Solve the system of equations.

$$\begin{aligned} x_1 - x_2 + 8x_3 &= -107 \\ 6x_1 + x_3 &= 17 \\ 3x_2 - 5x_3 &= 89 \end{aligned}$$

A. $(-5,-8,13)$

B. $(5,-8,-13)$

C. $(5,8,-13)$

D. $(-5,8,13)$

3. Solve the system of equations.

$$\begin{aligned} 4x_1 - x_2 + 3x_3 &= 12 \\ 2x_1 + 9x_3 &= -5 \\ x_1 + 4x_2 + 6x_3 &= -32 \end{aligned}$$

A. $(2,7,1)$

B. $(2,-7,-1)$

C. $(2,-7,1)$

D. $(2,7,-1)$

4. Solve the system of equations.

$$\begin{aligned} x_1 + x_2 + x_3 &= 6 \\ x_1 - x_3 &= -2 \\ x_2 + 3x_3 &= 11 \end{aligned}$$

A. $(6, -2, 11)$

B. $(-1, 2, -3)$

C. $(1, 2, 3)$

D. $(0, 1, 2)$

5. Solve the system of equations.

$$\begin{aligned} x_1 + x_2 + x_3 &= 7 \\ x_1 - x_2 + 2x_3 &= 7 \\ 5x_1 + x_2 + x_3 &= 11 \end{aligned}$$

A. $(4, 2, 1)$

B. $(4, 1, 2)$

C. $(1, 2, 4)$

D. $(1, 4, 2)$

6. Solve the system of equations.

$$\begin{aligned} x_1 - x_2 + x_3 &= 8 \\ x_1 + x_2 + x_3 &= 6 \\ x_1 + x_2 - x_3 &= -12 \end{aligned}$$

A. $(-2, -1, -9)$

B. $(2, -1, -9)$

C. $(-2, -1, 9)$

D. $(2, -1, 9)$

7. Solve the system of equations.

$$\begin{aligned} 5x_1 + 2x_2 + x_3 &= -11 \\ 2x_1 - 3x_2 - x_3 &= 17 \\ 7x_1 + x_2 + 2x_3 &= -4 \end{aligned}$$

A. $(0,6,-1)$

B. $(-3,0,4)$

C. $(3,0,-4)$

D. $(0,-6,1)$

8. Solve the system of equations.

$$\begin{aligned} 7x_1 + 7x_2 + x_3 &= 1 \\ x_1 + 8x_2 + 8x_3 &= 8 \\ 9x_1 + x_2 + 9x_3 &= 9 \end{aligned}$$

A. $(1,-1,1)$

B. $(-1,1,1)$

C. $(0,0,1)$

D. $(0,1,0)$

9. Solve the system of equations.

$$\begin{aligned} 2x_1 + x_2 &= 0 \\ x_1 - 3x_2 + x_3 &= 0 \\ 3x_1 + x_2 - x_3 &= 0 \end{aligned}$$

A. $(0,0,0)$

B. $(0,1,0)$

C. $(1,0,0)$

D. $(0,0,1)$

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10. Is the given system of equations consistent?

$$\begin{aligned} x_1 + x_2 + x_3 &= 7 \\ x_1 - x_2 + 2x_3 &= 7 \\ 5x_1 + x_2 + x_3 &= 11 \end{aligned}$$

- ○ Yes
- ○ No

11. Perform the matrix operation.

Let $B = \begin{bmatrix} -1 & 4 & 7 & -3 \end{bmatrix}$. Find $-2B$.

- ○ A. $\begin{bmatrix} 2 & 4 & 7 & -3 \end{bmatrix}$
- ○ B. $\begin{bmatrix} -2 & 8 & 14 & -6 \end{bmatrix}$
- ○ C. $\begin{bmatrix} 2 & -8 & -14 & 6 \end{bmatrix}$
- ○ D. $\begin{bmatrix} -3 & 2 & 5 & -5 \end{bmatrix}$

12. Perform the matrix operation.

Let $C = \begin{bmatrix} 2 \\ -2 \\ 8 \end{bmatrix}$. Find $\frac{1}{2}C$.

- ○ A. $\begin{bmatrix} 1 \\ -1 \\ 4 \end{bmatrix}$
- ○ B. $\begin{bmatrix} 1 \\ -2 \\ 8 \end{bmatrix}$
- ○ C. $\begin{bmatrix} 2 \\ -1 \\ 8 \end{bmatrix}$
- ○ D. $\begin{bmatrix} 4 \\ -4 \\ 16 \end{bmatrix}$

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13. Perform the matrix operation.

Let $A = \begin{bmatrix} 2 & 3 \\ 2 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 4 \\ -1 & 6 \end{bmatrix}$. Find $4A + B$.

A. $\begin{bmatrix} 8 & 16 \\ 7 & 22 \end{bmatrix}$

B. $\begin{bmatrix} 8 & 7 \\ 7 & 10 \end{bmatrix}$

C. $\begin{bmatrix} 8 & 16 \\ 1 & 10 \end{bmatrix}$

D. $\begin{bmatrix} 8 & 28 \\ 4 & 40 \end{bmatrix}$

14. Perform the matrix operation.

Let $C = \begin{bmatrix} 1 \\ -3 \\ 2 \end{bmatrix}$ and $D = \begin{bmatrix} -1 \\ 3 \\ -2 \end{bmatrix}$. Find $C - 2D$.

A. $\begin{bmatrix} 3 \\ -6 \\ 4 \end{bmatrix}$

B. $\begin{bmatrix} -1 \\ 3 \\ -2 \end{bmatrix}$

C. $\begin{bmatrix} 3 \\ -9 \\ 6 \end{bmatrix}$

D. $\begin{bmatrix} -3 \\ 9 \\ -6 \end{bmatrix}$

15. Perform the matrix operation.

Let $A = \begin{bmatrix} -2 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 \end{bmatrix}$. Find $3A + 4B$.

A. $\begin{bmatrix} -2 & 6 \end{bmatrix}$

B. $\begin{bmatrix} -6 & 4 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 2 \end{bmatrix}$

D. $\begin{bmatrix} -3 & 4 \end{bmatrix}$

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16. Perform the matrix operation.

Let $A = \begin{bmatrix} -2 & 3 \\ -3 & -5 \\ 6 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 8 & -9 \\ 4 & 3 \\ 7 & 3 \end{bmatrix}$. Find $A + B$.

A. $\begin{bmatrix} 6 & -6 \\ 1 & -2 \\ 13 & 6 \end{bmatrix}$

B. $\begin{bmatrix} 6 & -6 \\ -1 & -5 \\ 13 & -6 \end{bmatrix}$

C. $\begin{bmatrix} -10 & 12 \\ -7 & -7 \\ -1 & 12 \end{bmatrix}$

D. $\begin{bmatrix} 6 & -5 \\ 1 & -2 \\ 13 & 6 \end{bmatrix}$

17. Perform the matrix operation.

Let $A = \begin{bmatrix} -7 & 8 \\ -4 & -5 \end{bmatrix}$ and $B = \begin{bmatrix} 7 & 6 \\ -4 & 4 \end{bmatrix}$. Find $A - B$.

A. $\begin{bmatrix} -14 & 2 \\ 0 & -9 \end{bmatrix}$

B. $\begin{bmatrix} 14 & 2 \\ -8 & -1 \end{bmatrix}$

C. $\begin{bmatrix} 0 & -2 \\ -8 & 9 \end{bmatrix}$

D. $\begin{bmatrix} 0 & 2 \\ 0 & -9 \end{bmatrix}$

18. Perform the matrix operation.

Let $A = \begin{bmatrix} -10 & 2 \\ 4 & -9 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$. Find $A + B$.

A. $\begin{bmatrix} -10 & 2 \\ 4 & -9 \end{bmatrix}$

B. $\begin{bmatrix} 10 & -2 \\ -4 & 9 \end{bmatrix}$

C. Undefined

D. $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

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19. Find the matrix product AB, if it is defined.

$A = \begin{bmatrix} -2 & 3 \\ 3 & 2 \end{bmatrix}, B = \begin{bmatrix} -2 & 0 \\ -1 & 2 \end{bmatrix}$

A. $\begin{bmatrix} 1 & 6 \\ -8 & 4 \end{bmatrix}$

B. $\begin{bmatrix} 4 & -6 \\ -4 & 1 \end{bmatrix}$

C. $\begin{bmatrix} 4 & 0 \\ -3 & 4 \end{bmatrix}$

D. $\begin{bmatrix} 6 & 1 \\ 4 & -8 \end{bmatrix}$

20. Find the matrix product AB, if it is defined.

$A = \begin{bmatrix} 0 & -2 \\ 5 & 1 \end{bmatrix}, B = \begin{bmatrix} -2 & 0 \\ -1 & 1 \end{bmatrix}$

A. $\begin{bmatrix} 2 & -2 \\ -11 & 1 \end{bmatrix}$

B. $\begin{bmatrix} -10 & -2 \\ 5 & 3 \end{bmatrix}$

C. $\begin{bmatrix} 0 & 4 \\ -5 & 1 \end{bmatrix}$

D. $\begin{bmatrix} -2 & 2 \\ -9 & -11 \end{bmatrix}$

21. Find the indicated vector.

Let $\mathbf{u} = \begin{bmatrix} -6 \\ -3 \end{bmatrix}, \mathbf{v} = \begin{bmatrix} 6 \\ -5 \end{bmatrix}$. Find $\mathbf{u} + \mathbf{v}$.

A. $\begin{bmatrix} -11 \\ 3 \end{bmatrix}$

B. $\begin{bmatrix} 0 \\ -8 \end{bmatrix}$

C. $\begin{bmatrix} -9 \\ 1 \end{bmatrix}$

D. $\begin{bmatrix} -12 \\ 2 \end{bmatrix}$

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22. Find the indicated vector.

Let $\mathbf{u} = \begin{bmatrix} 7 \\ 7 \end{bmatrix}$, $\mathbf{v} = \begin{bmatrix} 2 \\ -6 \end{bmatrix}$. Find $\mathbf{u} - \mathbf{v}$.

A. $\begin{bmatrix} 13 \\ 5 \end{bmatrix}$

B. $\begin{bmatrix} 0 \\ 8 \end{bmatrix}$

C. $\begin{bmatrix} 9 \\ 1 \end{bmatrix}$

D. $\begin{bmatrix} 5 \\ 13 \end{bmatrix}$

23. Find the indicated vector.

Let $\mathbf{u} = \begin{bmatrix} -3 \\ -4 \end{bmatrix}$, $\mathbf{v} = \begin{bmatrix} 5 \\ 9 \end{bmatrix}$. Find $\mathbf{v} - \mathbf{u}$.

A. $\begin{bmatrix} 2 \\ 5 \end{bmatrix}$

B. $\begin{bmatrix} 8 \\ 13 \end{bmatrix}$

C. $\begin{bmatrix} -1 \\ 4 \end{bmatrix}$

D. $\begin{bmatrix} 12 \\ 9 \end{bmatrix}$

24. Find the indicated vector.

Let $\mathbf{u} = \begin{bmatrix} 9 \\ 5 \end{bmatrix}$. Find $8\mathbf{u}$.

A. $\begin{bmatrix} -72 \\ 40 \end{bmatrix}$

B. $\begin{bmatrix} 72 \\ 40 \end{bmatrix}$

C. $\begin{bmatrix} 17 \\ 13 \end{bmatrix}$

D. $\begin{bmatrix} 72 \\ 5 \end{bmatrix}$

25. Find the indicated vector.

Let $\mathbf{u} = \begin{bmatrix} 6 \\ -5 \end{bmatrix}$. Find $6\mathbf{u}$.

A. $\begin{bmatrix} 12 \\ 1 \end{bmatrix}$

B. $\begin{bmatrix} -36 \\ -5 \end{bmatrix}$

C. $\begin{bmatrix} 36 \\ 30 \end{bmatrix}$

D. $\begin{bmatrix} 36 \\ -30 \end{bmatrix}$

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26. Find the indicated vector.

Let $\mathbf{u} = \begin{bmatrix} 9 \\ 5 \end{bmatrix}$. Find $-2\mathbf{u}$.

A. $\begin{bmatrix} 7 \\ 3 \end{bmatrix}$

B. $\begin{bmatrix} 18 \\ 10 \end{bmatrix}$

C. $\begin{bmatrix} 18 \\ 5 \end{bmatrix}$

D. $\begin{bmatrix} -18 \\ -10 \end{bmatrix}$

27. Find the indicated vector.

Let $\mathbf{u} = \begin{bmatrix} -9 \\ 3 \end{bmatrix}$. Find $-3\mathbf{u}$.

A. $\begin{bmatrix} 27 \\ 3 \end{bmatrix}$

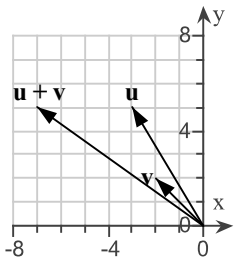
B. $\begin{bmatrix} 27 \\ -9 \end{bmatrix}$

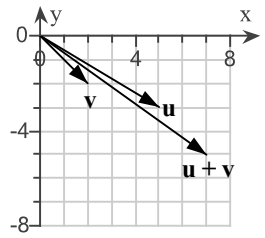
C. $\begin{bmatrix} -27 \\ -9 \end{bmatrix}$

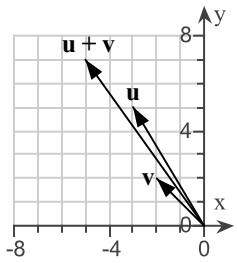
D. $\begin{bmatrix} -12 \\ 0 \end{bmatrix}$

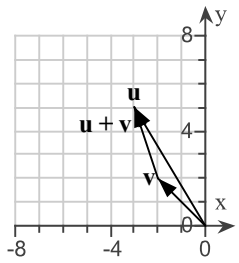
28. Display the vectors **u**, **v**, and **u** + **v** on an xy-graph.

Let $\mathbf{u} = \begin{bmatrix} -3 \\ 5 \end{bmatrix}$ and $\mathbf{v} = \begin{bmatrix} -2 \\ 2 \end{bmatrix}$.

A.


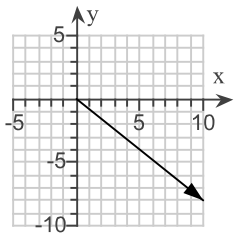
B.


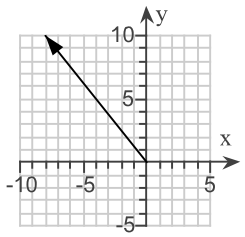
C.


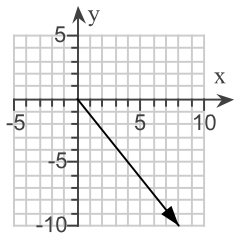
D.


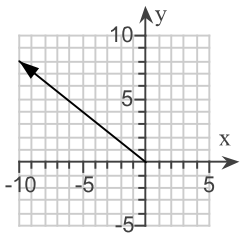
29. Display the vector **2u** on an xy-graph.

Let $\mathbf{u} = \begin{bmatrix} 5 \\ -4 \end{bmatrix}$.

A.


B.


C.


D.


30. Determine whether **b** can be written as a linear combination of $\mathbf{a}_1$ and $\mathbf{a}_2$. In other words, determine whether weights x_1 and x_2 exist, such that $x_1\mathbf{a}_1 + x_2\mathbf{a}_2 = \mathbf{b}$. Determine the weights x_1 and x_2 if possible.

Let $\mathbf{a}_1 = \begin{bmatrix} 6 \\ 2 \\ -6 \end{bmatrix}$, $\mathbf{a}_2 = \begin{bmatrix} -6 \\ 1 \\ 3 \end{bmatrix}$, and $\mathbf{b} = \begin{bmatrix} -6 \\ -8 \\ 12 \end{bmatrix}$.

A. $x_1 = -3, x_2 = -2$

B. $x_1 = -3, x_2 = -1$

C. $x_1 = -2, x_2 = -3$

D. There is no solution.

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31. Determine whether $\mathbf{b}$ can be written as a linear combination of $\mathbf{a_1}$, $\mathbf{a_2}$, and $\mathbf{a_3}$. In other words, determine whether weights x_1, x_2, and x_3 exist, such that $x_1\mathbf{a_1} + x_2\mathbf{a_2} + x_3\mathbf{a_3} = \mathbf{b}$. Determine the weights x_1, x_2, and x_3 if possible.

Let $\mathbf{a_1} = \begin{bmatrix} 1 \\ 2 \\ -3 \end{bmatrix}$, $\mathbf{a_2} = \begin{bmatrix} -3 \\ -4 \\ 1 \end{bmatrix}$, $\mathbf{a_3} = \begin{bmatrix} 2 \\ 1 \\ 6 \end{bmatrix}$, and $\mathbf{b} = \begin{bmatrix} 5 \\ 3 \\ -2 \end{bmatrix}$.

A. $x_1 = -2, x_2 = -1, x_3 = 3$

B. $x_1 = 2, x_2 = 1, x_3 = 3$

C. $x_1 = 3, x_2 = 0, x_3 = 1$

D. There is no solution.