Algebra 2

1-Review

Take this test as you would take a test in class. When you are finished, check your work against the answers.

1-01

Graph the system and estimate the solution.

1. $\begin{cases} y = \frac{2}{3}x + 1 \\ y = -\frac{1}{2}x - \frac{5}{2} \end{cases}$

2. $\begin{cases} 2x + y = 3 \\ x - y = 0 \end{cases}$

Graph the system of inequalities.

3. $\begin{cases} y < 2x + 1 \\ y \geq -x - 2 \end{cases}$

1-02

Solve the system algebraically.

4. $\begin{cases} y = x + 2 \\ 2x - 2y = 3 \end{cases}$

5. $\begin{cases} 3x - 2y = -7 \\ x + 2y = 11 \end{cases}$

6. Jim has two jobs. The first week he works 2 hours at job A and 3 hours at job B and earns \$57.50. The second week he works 5 hours at job A and 2 hours at job B and earns \$75. What is his pay rate at job A?

7. How do you know if there are many solutions when you are solving algebraically?

1-03

Is the given point a solution to the system?

8. $\begin{cases} x - y + 2z = -7 \\ y - 3z = 11 \\ x + z = -2 \end{cases}$; point $(1, 2, -3)$

Solve the system algebraically.

9. $\begin{cases} x + y + z = 4 \\ -x + y - 2z = -4 \\ -2y - z = -4 \end{cases}$

10. What does the graph of a linear equation in three variables look like?

1-04

Simplify.

11. $\begin{bmatrix} 1 & 8 \\ -3 & 5 \end{bmatrix} - \begin{bmatrix} -2 & 0 \\ -9 & -4 \end{bmatrix}$

12. $3\begin{bmatrix} 2 & 8 \end{bmatrix}$

13. $2\begin{bmatrix} 3 \\ -4 \end{bmatrix} + \begin{bmatrix} 1 \\ 5 \end{bmatrix}$

1-05

Simplify.

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

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

16. How do you know if two matrices can be multiplied?

1-06

Evaluate the determinant.

17. $\begin{vmatrix} 3 & -1 \\ 2 & 7 \end{vmatrix}$

18. $\begin{vmatrix} 1 & 3 & 0 \\ -2 & -1 & 2 \\ 4 & 0 & -1 \end{vmatrix}$

19. Find the area of the triangle with vertices $(1, 2)$, $(0, -2)$, $(3, 1)$.

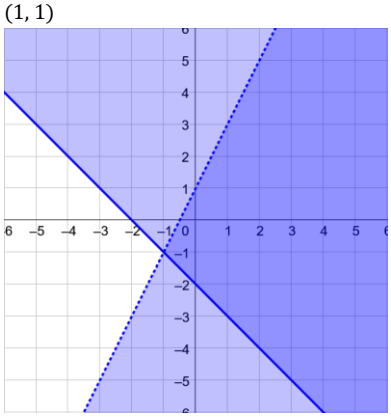
1-07

20. What is the product of a matrix with its inverse?

21. Find inverse of $\begin{bmatrix} 2 & 1 \\ 1 & -3 \end{bmatrix}$.

22. Use an inverse to solve $\begin{cases} 2x + y = 8 \\ x - 3y = -3 \end{cases}$.

Answers

1. $(-3, -1)$
2. $(1, 1)$
3. 
4. No solution
5. $(1, 5)$
6. \$10 per hour
7. All variables are eliminated and the result is a true statement.
8. Yes
9. $(1, 1, 2)$
10. A plane
11. $\begin{bmatrix} 3 & 8 \\ 6 & 9 \end{bmatrix}$
12. $[6 \quad 24]$
13. $\begin{bmatrix} 7 \\ -3 \end{bmatrix}$
14. $[-4 \; 11]$
15. $\begin{bmatrix} 5 & -5 \\ -7 & 7 \end{bmatrix}$
16. The number of columns in the 1st matrix = number of rows in the 2nd matrix
17. 23
18. 19
19. $\frac{9}{2}$
20. Identity matrix
21. $\begin{bmatrix} \frac{3}{7} & \frac{1}{7} \\ \frac{1}{7} & -\frac{2}{7} \end{bmatrix}$
22. $(3, 2)$