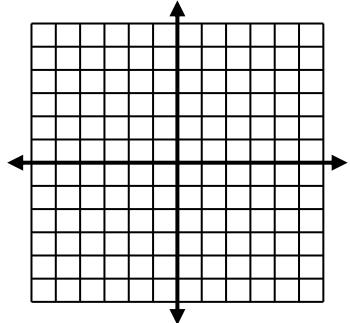
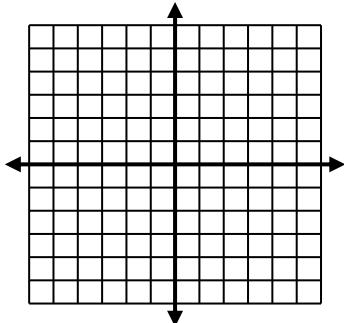
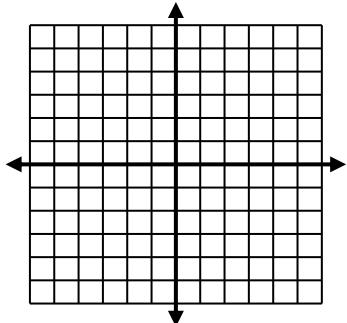


Sketch the system and estimate the solutions.

1. $x^2 + 5 = y$
 $x + y = 4$

2. $4x^2 + y^2 = 16$
 $y = x^2 - 2$

3. $y = x^2 - 2x$
 $x = 2y^2$

**Solve the system of equations.**

4. $y = x^2 - 3$
 $y = 2x$

5. $x^2 - y^2 = 8$
 $x - 3y = 0$

6. $4x^2 + y^2 = 16$
 $x^2 + y^2 = 7$

7. $x + 2y - z = 5$
 $2x - y + z = 2$
 $3x + y + 2z = 5$

8. $2x - 2y + z = -3$
 $x + y - z = -4$
 $3x + 2y + 2z = 2$

Use the following matrices to perform the indicated operation, or explain why it cannot be done.

$$A = \begin{bmatrix} 2 & 0 & -1 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 2 & 4 \\ -2 & 1 & 0 \end{bmatrix} \quad C = \begin{bmatrix} 0 & 3 \\ 2 & -1 \\ -2 & 1 \end{bmatrix} \quad D = \begin{bmatrix} 1 & 4 \\ 0 & -1 \\ 2 & 0 \end{bmatrix} \quad E = \begin{bmatrix} 2 & -1 \\ -5 & 6 \end{bmatrix} \quad F = \begin{bmatrix} 4 & 0 & 2 \\ -1 & 1 & 0 \\ 7 & 5 & 0 \end{bmatrix} \quad G = \begin{bmatrix} 4 & -3 \\ 2 & 0 \end{bmatrix}$$

9. $3E - 4G$

10. G^2

11. CB

Use the following matrices to solve the matrix equation for the unknown matrix, X, or show that no solution exists.

$$A = \begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix} \quad B = \begin{bmatrix} 1 & -2 \\ -2 & 4 \end{bmatrix} \quad C = \begin{bmatrix} 0 & 1 & 3 \\ -2 & 4 & 0 \end{bmatrix} \quad D = \begin{bmatrix} 5 & 0 & -1 \\ 2 & -3 & 1 \end{bmatrix}$$

12. $A + 3X = B$

13. $\frac{1}{2}(X - 2B) = A$

14. $2(X - A) = 3B$

15. $2X + C = 5A$

16. $A + 2X = D$

17. $C - 4X = D$

Evaluate. Determine if an inverse will exist. Be sure that you can do the problem by hand and on the graphing calculator.

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

19. $\begin{vmatrix} 3 & -4 \\ 5 & -6 \end{vmatrix}$

20. $\begin{vmatrix} -5 & 4 \\ -6 & 0 \end{vmatrix}$

Evaluate. Determine if an inverse will exist. Be sure that you can do the problem by hand and on the graphing calculator.

$$21. \begin{vmatrix} 3 & 0 & -1 \\ 2 & -3 & 0 \\ -4 & -2 & 1 \end{vmatrix}$$

$$22. \begin{vmatrix} 2 & -4 & 0 \\ -1 & 1 & 2 \\ 0 & -3 & -2 \end{vmatrix}$$

$$23. \begin{vmatrix} -1 & 2 & 3 \\ -2 & -4 & 5 \\ -2 & 5 & -6 \end{vmatrix}$$

Find the inverse of each matrix. If the matrix has no inverse, say so.

$$24. \begin{bmatrix} 5 & -7 \\ -3 & 4 \end{bmatrix}$$

$$25. \begin{bmatrix} 7 & 2 \\ -1 & 0 \end{bmatrix}$$

$$26. \begin{bmatrix} 4 & 10 \\ 2 & 5 \end{bmatrix}$$

Solve the system of equations using matrices. 2x2 must be done by hand, 3x3 can be done on the calculator.

$$27. \begin{aligned} 12x - 5y &= 10 \\ 5x - 2y &= 17 \end{aligned}$$

$$28. \begin{aligned} 6x - 5y &= 1 \\ 8x - 7y &= -1 \end{aligned}$$

$$\begin{aligned} 2x + y + 5z &= \frac{1}{3} \\ 29. \quad x + 2y + 2z &= \frac{1}{4} \\ x + \quad \quad 3z &= \frac{1}{6} \end{aligned}$$

$$\begin{aligned} 2x &\quad + 3z = 5 \\ 30. \quad x + y + 6z &= 0 \\ 3x - y + z &= 5 \end{aligned}$$

Solve the system using Cramer's Rule. 2x2 must be done by hand, 3x3 can be done on the calculator.

$$31. \begin{aligned} 2x + 7y &= 13 \\ 6x + 16y &= 30 \end{aligned}$$

$$32. \begin{aligned} 12x - 11y &= 140 \\ 7x + 9y &= 20 \end{aligned}$$

$$33. \begin{aligned} 3x - 2y &= 4 \\ -6x + 4y &= 7 \end{aligned}$$

$$34. \begin{aligned} 5x + 2y &= 3 \\ -10x - 4y &= -6 \end{aligned}$$

$$35. \begin{aligned} 2x - y + 5z &= 0 \\ -x + 7y &= 9 \\ 5x + 4y + 3z &= -9 \end{aligned}$$

$$36. \begin{aligned} 3x + 4y - z &= 10 \\ x &= 4z = 20 \\ 2x + y + 5z &= 30 \end{aligned}$$

Answers

1. No Solution

4. $(3, 6)(-1, -2)$ 8. $(-2, 1, 3)$

12. $\begin{bmatrix} -\frac{1}{3} & -1 \\ -\frac{5}{3} & \frac{2}{3} \end{bmatrix}$

16. Not Possible

20. $24, Yes$

24. $\begin{bmatrix} -4 & -7 \\ -3 & -5 \end{bmatrix}$

28. $\begin{bmatrix} 6 \\ 7 \end{bmatrix}$

32. $(8, -4)$

36. $\left(\frac{860}{41}, -\frac{540}{41}, \frac{10}{41}\right)$

2. $(-2, 1.5)(2, 1.5)$ 5. $(3, 1)(3, -1)$

9. $\begin{bmatrix} -10 & 9 \\ -23 & 18 \end{bmatrix}$

13. $\begin{bmatrix} 6 & -2 \\ 2 & 12 \end{bmatrix}$

17. $\begin{bmatrix} -\frac{5}{4} & \frac{1}{4} & 1 \\ -1 & \frac{7}{4} & -\frac{1}{4} \end{bmatrix}$

21. $7, Yes$

25. $\begin{bmatrix} 0 & -1 \\ \frac{1}{2} & \frac{7}{2} \end{bmatrix}$

29. $\begin{bmatrix} -\frac{1}{12} \\ \frac{1}{12} \\ \frac{1}{12} \end{bmatrix}$

33. No Solution

3. $(0,0)(2.5,1.2)(2.5,-1.2)$ 6. $(\pm\sqrt{3}, \pm 2)$

10. $\begin{bmatrix} 10 & -12 \\ 8 & -6 \end{bmatrix}$

14. $\begin{bmatrix} \frac{7}{2} & -2 \\ 0 & 8 \end{bmatrix}$

18. $-43, Yes$ 22. $16, Yes$

26. No Inverse Exists

30. $\begin{bmatrix} 10 \\ 20 \\ -5 \end{bmatrix}$

34. Infinite Solutions

15. Not Possible

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

11. $\begin{bmatrix} -6 & 3 & 0 \\ 4 & 3 & 8 \\ -4 & -3 & -8 \end{bmatrix}$

19. $2, Yes$ 23. $-97, Yes$

27. $\begin{bmatrix} 65 \\ 154 \end{bmatrix}$

31. $\left(\frac{1}{5}, \frac{9}{5}\right)$

35. $\left(-\frac{87}{26}, \frac{21}{26}, \frac{3}{2}\right)$