Write the system of equations as a matrix equation. Then solve the system, if possible, by using a matrix equation. If not possible, classify the system.

1. $\begin{cases} x+3y-2z=17 \\ x-3y-2z=-1 \\ x+3y+2z=9 \end{cases}$

[A] $\begin{bmatrix} 1 & 3 & -2 \\ 1 & -3 & -2 \\ 1 & 3 & 2 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix}=\begin{bmatrix} 17 \\ -1 \\ 9 \end{bmatrix}$; $(4,\ 3,\ -2)$

[B] $\begin{bmatrix} 17 \\ -1 \\ 9 \end{bmatrix}\begin{bmatrix} x & y & z \end{bmatrix}=\begin{bmatrix} 1 & 3 & -2 \\ 1 & -3 & -2 \\ 1 & 3 & 2 \end{bmatrix}$; $(5,\ 3,\ -2)$

[C] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 1 & 3 & -2 \\ 1 & -3 & -2 \\ 1 & 3 & 2 \end{bmatrix}=\begin{bmatrix} 17 & -1 & 9 \end{bmatrix}$; $(5,\ -3,\ -2)$

[D] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 1 & -3 & -2 \\ -1 & -3 & 2 \\ 1 & -3 & 2 \end{bmatrix}=\begin{bmatrix} 17 & -1 & 9 \end{bmatrix}$; $(4,\ -3,\ 4)$

Write the system of equations as a matrix equation. Then solve the system, if possible, by using a matrix equation. If not possible, classify the system.

2. $\begin{cases} 2x + y + 3z = 12 \\ 2x - y - 3z = -8 \\ 2x - y + 3z = 16 \end{cases}$

[A] $\begin{bmatrix} 12 \\ -8 \\ 16 \end{bmatrix} \begin{bmatrix} x & y & z \end{bmatrix} = \begin{bmatrix} 2 & 1 & 3 \\ 2 & -1 & -3 \\ 2 & -1 & 3 \end{bmatrix}$; dependent, infinitely many solutions.

[B] $\begin{bmatrix} 2 & 1 & 3 \\ 2 & -1 & -3 \\ 2 & -1 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 12 \\ -8 \\ 16 \end{bmatrix}$; $(1,\ -2,\ 4)$

[C] $\begin{bmatrix} x & y & z \end{bmatrix} \begin{bmatrix} 2 & -1 & 3 \\ -2 & -1 & 3 \\ 2 & 1 & 3 \end{bmatrix} = \begin{bmatrix} 12 & -8 & 16 \end{bmatrix}$; $(1,\ 2,\ -2)$

[D] $\begin{bmatrix} x & y & z \end{bmatrix} \begin{bmatrix} 2 & 1 & 3 \\ 2 & -1 & -3 \\ 2 & -1 & 3 \end{bmatrix} = \begin{bmatrix} 12 & -8 & 16 \end{bmatrix}$; inverse = 0; no solution.

Write the system of equations as a matrix equation. Then solve the system, if possible, by using a matrix equation. If not possible, classify the system.

3. $\begin{cases} 2x+3y-z=-20 \\ 2x-3y+z=0 \\ -6x-9y+3z=60 \end{cases}$

[A] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 2 & 3 & -1 \\ 2 & -3 & 1 \\ -6 & -9 & 3 \end{bmatrix}=\begin{bmatrix} -20 & 0 & 60 \end{bmatrix}$; inverse = 0; no solution.

[B] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 2 & -3 & -1 \\ -2 & -3 & -1 \\ -6 & -3 & 3 \end{bmatrix}=\begin{bmatrix} -20 & 0 & 60 \end{bmatrix}$; $(-5,\ 4,\ 4)$

[C] $\begin{bmatrix} -20 \\ 0 \\ 60 \end{bmatrix}\begin{bmatrix} x & y & z \end{bmatrix}=\begin{bmatrix} 2 & 3 & -1 \\ 2 & -3 & 1 \\ -6 & -9 & 3 \end{bmatrix}$; $(-4,\ -4,\ -2)$

[D] $\begin{bmatrix} 2 & 3 & -1 \\ 2 & -3 & 1 \\ -6 & -9 & 3 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix}=\begin{bmatrix} -20 \\ 0 \\ 60 \end{bmatrix}$; dependent, infinitely many solutions.

Write the system of equations as a matrix equation. Then solve the system, if possible, by using a matrix equation. If not possible, classify the system.

4. $\begin{cases} 2x+3y+z=-9 \\ 2x-3y-z=5 \\ 2x-3y+z=15 \end{cases}$

[A] $\begin{bmatrix} -9 \\ 5 \\ 15 \end{bmatrix}\begin{bmatrix} x & y & z \end{bmatrix}=\begin{bmatrix} 2 & 3 & 1 \\ 2 & -3 & -1 \\ 2 & -3 & 1 \end{bmatrix}$; $(0,\ -4,\ 5)$

[B] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 2 & -3 & 1 \\ -2 & -3 & 1 \\ 2 & 3 & 1 \end{bmatrix}=\begin{bmatrix} -9 & 5 & 15 \end{bmatrix}$; $(-1,\ 4,\ -3)$

[C] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 2 & 3 & 1 \\ 2 & -3 & -1 \\ 2 & -3 & 1 \end{bmatrix}=\begin{bmatrix} -9 & 5 & 15 \end{bmatrix}$; $(0,\ 4,\ 5)$

[D] $\begin{bmatrix} 2 & 3 & 1 \\ 2 & -3 & -1 \\ 2 & -3 & 1 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix}=\begin{bmatrix} -9 \\ 5 \\ 15 \end{bmatrix}$; $(-1,\ -4,\ 5)$

Write the system of equations as a matrix equation. Then solve the system, if possible, by using a matrix equation. If not possible, classify the system.

5. $\begin{cases} x-2y+3z=-3 \\ -3x+6y-9z=9 \\ x+2y+3z=-15 \end{cases}$

[A] $\begin{bmatrix} 1 & -2 & 3 \\ -3 & 6 & -9 \\ 1 & 2 & 3 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix}=\begin{bmatrix} -3 \\ 9 \\ -15 \end{bmatrix}$; inverse = 0; no solution.

[B] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 1 & -2 & 3 \\ -3 & 6 & -9 \\ 1 & 2 & 3 \end{bmatrix}=\begin{bmatrix} -3 & 9 & -15 \end{bmatrix}$; dependent, infinitely many solutions.

[C] $\begin{bmatrix} -3 \\ 9 \\ -15 \end{bmatrix}\begin{bmatrix} x & y & z \end{bmatrix}=\begin{bmatrix} 1 & -2 & 3 \\ -3 & 6 & -9 \\ 1 & 2 & 3 \end{bmatrix}$; $(4,\ -3,\ -4)$

[D] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 1 & 2 & 3 \\ -1 & 6 & 3 \\ 1 & -2 & 3 \end{bmatrix}=\begin{bmatrix} -3 & 9 & -15 \end{bmatrix}$; $(3,\ 3,\ 6)$

Write the system of equations as a matrix equation. Then solve the system, if possible, by using a matrix equation. If not possible, classify the system.

6. $\begin{cases} x-3y-2z=-3 \\ 2x-6y-4z=-6 \\ x+3y-2z=21 \end{cases}$

[A] $\begin{bmatrix} 1 & -3 & -2 \\ 2 & -6 & -4 \\ 1 & 3 & -2 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix}=\begin{bmatrix} -3 \\ 5 \\ 21 \end{bmatrix}$; inverse = 0; no solution.

[B] $\begin{bmatrix} -3 \\ 5 \\ 21 \end{bmatrix}\begin{bmatrix} x & y & z \end{bmatrix}=\begin{bmatrix} 1 & -3 & -2 \\ 2 & -6 & -4 \\ 1 & 3 & -2 \end{bmatrix}$; $(2,\ 4,\ -4)$

[C] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 1 & 3 & -2 \\ -1 & -6 & -2 \\ 1 & -3 & -2 \end{bmatrix}=\begin{bmatrix} -3 & 5 & 21 \end{bmatrix}$; $(1,\ -4,\ 6)$

[D] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 1 & -3 & -2 \\ 2 & -6 & -4 \\ 1 & 3 & -2 \end{bmatrix}=\begin{bmatrix} -3 & 5 & 21 \end{bmatrix}$; dependent, infinitely many solutions.

Write the system of equations as a matrix equation. Then solve the system, if possible, by using a matrix equation. If not possible, classify the system.

7. $\begin{cases} 2x+3y-z=-3 \\ 2x-3y+z=-5 \\ 2x-3y-z=-9 \end{cases}$

[A] $\begin{bmatrix} 2 & 3 & -1 \\ 2 & -3 & 1 \\ 2 & -3 & -1 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix}=\begin{bmatrix} -3 \\ -5 \\ -9 \end{bmatrix}$; $(-2,\ 1,\ 2)$

[B] $\begin{bmatrix} -3 \\ -5 \\ -9 \end{bmatrix}\begin{bmatrix} x & y & z \end{bmatrix}=\begin{bmatrix} 2 & 3 & -1 \\ 2 & -3 & 1 \\ 2 & -3 & -1 \end{bmatrix}$; dependent, infinitely many solutions.

[C] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 2 & -3 & -1 \\ -2 & -3 & -1 \\ 2 & 3 & -1 \end{bmatrix}=\begin{bmatrix} -3 & -5 & -9 \end{bmatrix}$; $(-2,\ -1,\ 0)$

[D] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 2 & 3 & -1 \\ 2 & -3 & 1 \\ 2 & -3 & -1 \end{bmatrix}=\begin{bmatrix} -3 & -5 & -9 \end{bmatrix}$; inverse $= 0$; no solution.

Write the system of equations as a matrix equation. Then solve the system, if possible, by using a matrix equation. If not possible, classify the system.

8. $\begin{cases} x+3y-2z=-14 \\ x+3y+2z=-6 \\ x-3y-2z=-2 \end{cases}$

[A] $\begin{bmatrix} -14 \\ -6 \\ -2 \end{bmatrix}\begin{bmatrix} x & y & z \end{bmatrix}=\begin{bmatrix} 1 & 3 & -2 \\ 1 & 3 & 2 \\ 1 & -3 & -2 \end{bmatrix}$; $(-3,\ -2,\ 2)$

[B] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 1 & -3 & -2 \\ -1 & 3 & -2 \\ 1 & 3 & -2 \end{bmatrix}=\begin{bmatrix} -14 & -6 & -2 \end{bmatrix}$; $(-4,\ 2,\ 0)$

[C] $\begin{bmatrix} 1 & 3 & -2 \\ 1 & 3 & 2 \\ 1 & -3 & -2 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix}=\begin{bmatrix} -14 \\ -6 \\ -2 \end{bmatrix}$; $(-4,\ -2,\ 2)$

[D] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 1 & 3 & -2 \\ 1 & 3 & 2 \\ 1 & -3 & -2 \end{bmatrix}=\begin{bmatrix} -14 & -6 & -2 \end{bmatrix}$; $(-3,\ 2,\ 2)$

Write the system of equations as a matrix equation. Then solve the system, if possible, by using a matrix equation. If not possible, classify the system.

9. $\begin{cases} x+2y-3z=-20 \\ x+2y+3z=-2 \\ x-2y+3z=10 \end{cases}$

[A] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 1 & 2 & -3 \\ 1 & 2 & 3 \\ 1 & -2 & 3 \end{bmatrix}=\begin{bmatrix} -20 & -2 & 10 \end{bmatrix};\ (-4,\ 3,\ 3)$

[B] $\begin{bmatrix} -20 \\ -2 \\ 10 \end{bmatrix}\begin{bmatrix} x & y & z \end{bmatrix}=\begin{bmatrix} 1 & 2 & -3 \\ 1 & 2 & 3 \\ 1 & -2 & 3 \end{bmatrix};\ (-4,\ -3,\ 3)$

[C] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 1 & -2 & -3 \\ -1 & 2 & -3 \\ 1 & 2 & 3 \end{bmatrix}=\begin{bmatrix} -20 & -2 & 10 \end{bmatrix};\ (-5,\ 3,\ -1)$

[D] $\begin{bmatrix} 1 & 2 & -3 \\ 1 & 2 & 3 \\ 1 & -2 & 3 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix}=\begin{bmatrix} -20 \\ -2 \\ 10 \end{bmatrix};\ (-5,\ -3,\ 3)$

Write the system of equations as a matrix equation. Then solve the system, if possible, by using a matrix equation. If not possible, classify the system.

10. $\begin{cases} x+3y-2z=-22 \\ x-3y+2z=16 \\ 2x+6y-4z=-44 \end{cases}$

[A] $\begin{bmatrix} -22 \\ 16 \\ -44 \end{bmatrix}\begin{bmatrix} x & y & z \end{bmatrix}=\begin{bmatrix} 1 & 3 & -2 \\ 1 & -3 & 2 \\ 2 & 6 & -4 \end{bmatrix}$; $(-2,\ -5,\ 2)$

[B] $\begin{bmatrix} 1 & 3 & -2 \\ 1 & -3 & 2 \\ 2 & 6 & -4 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix}=\begin{bmatrix} -22 \\ 16 \\ -44 \end{bmatrix}$; dependent, infinitely many solutions.

[C] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 1 & -3 & -2 \\ -1 & -3 & -2 \\ 2 & -3 & -4 \end{bmatrix}=\begin{bmatrix} -22 & 16 & -44 \end{bmatrix}$; $(-3,\ 5,\ 0)$

[D] $\begin{bmatrix} x & y & z \end{bmatrix}\begin{bmatrix} 1 & 3 & -2 \\ 1 & -3 & 2 \\ 2 & 6 & -4 \end{bmatrix}=\begin{bmatrix} -22 & 16 & -44 \end{bmatrix}$; inverse = 0; no solution.

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

12. $\begin{cases} 3x+3y=-24 \\ 3x+3y=-29 \end{cases}$

13. $\begin{cases} 7x-5y=-16 \\ 4x+6y=44 \end{cases}$

14. $\begin{cases} 5x+5y=-5 \\ 7x+2y=-32 \end{cases}$

Write the system of equations as a matrix equation. Then solve the system, if possible, by using a matrix equation. If not possible, classify the system.

15. $\begin{cases} 5x + y = -33 \\ 2x + 4y = -6 \end{cases}$

16. $\begin{cases} 4x - 6y = -34 \\ 6x + 3y = -15 \end{cases}$

17. $\begin{cases} x + y = -1 \\ 3x + 3y = -3 \end{cases}$

18. $\begin{cases} 3x - 5y = 31 \\ 3x - 5y = 37 \end{cases}$

19. $\begin{cases} 4x - 4y = 48 \\ 6x + 3y = 18 \end{cases}$

20. $\begin{cases} 2x + 6y = -10 \\ 5x + 3y = -13 \end{cases}$

21. $\begin{cases} x + 3y + z = 5 \\ 2x + 7y + 3z = 7 \\ x - y + 2z = -8 \end{cases}$

22. $\begin{cases} x + 2y + z = 13 \\ 3x + 7y + 4z = 43 \\ x - y - 5z = -2 \end{cases}$

23. $\begin{cases} x + 2y + z = -15 \\ 3x + 7y + 2z = -50 \\ x - y - 6z = 10 \end{cases}$

Write the system of equations as a matrix equation. Then solve the system, if possible, by using a matrix equation. If not possible, classify the system.

24. $\begin{cases} x+2y+z=-15 \\ 3x+7y+4z=-53 \\ x-y+4z=-21 \end{cases}$

25. $\begin{cases} x+3y+z=19 \\ 2x+7y+2z=42 \\ x-y-z=1 \end{cases}$

26. $\begin{cases} x+2y+z=-2 \\ 3x+7y+3z=-8 \\ x-y+3z=-2 \end{cases}$

27. $\begin{cases} x+3y+z=5 \\ 2x+7y-2z=-11 \\ x-y+6z=34 \end{cases}$

28. $\begin{cases} x+3y+z=16 \\ 2x+7y-4z=62 \\ x-y+5z=-24 \end{cases}$

29. $\begin{cases} x+3y+z=-14 \\ 2x+7y+3z=-30 \\ x-y+2z=9 \end{cases}$

30. $\begin{cases} x+3y+z=-13 \\ 2x+7y-4z=-38 \\ x-y+z=11 \end{cases}$