

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

14. Inverse does not exist.

15. $\begin{bmatrix} \frac{-2}{5} & 0 & \frac{3}{5} \\ \frac{-1}{5} & \frac{1}{5} & 0 \\ \frac{2}{5} & \frac{1}{5} & \frac{-2}{5} \end{bmatrix}$

16. $\begin{bmatrix} 1 & \frac{-2}{5} & \frac{-3}{5} \\ \frac{-2}{5} & \frac{4}{25} & \frac{11}{25} \\ \frac{-3}{5} & \frac{1}{25} & \frac{9}{25} \end{bmatrix}$

17. $\begin{bmatrix} 3 & -1 & 1 \\ -15 & 6 & -5 \\ 5 & -2 & 2 \end{bmatrix}$

18. D

Miscellaneous Exercise on Chapter 3

6. $x = \pm \frac{1}{\sqrt{2}}, y = \pm \frac{1}{\sqrt{6}}, z = \pm \frac{1}{\sqrt{3}}$

7. $x = -1$

9. $x = \pm 4\sqrt{3}$

10. (a) Total revenue in the market - I = ₹ 46000
Total revenue in the market - II = ₹ 53000

(b) ₹ 15000, ₹ 17000

11. $X = \begin{bmatrix} 1 & -2 \\ 2 & 0 \end{bmatrix}$

13. C

14. B

15. C

EXERCISE 4.1

1. (i) 18

2. (i) 1, (ii) $x^3 - x^2 + 2$

5. (i) -12, (ii) 46, (iii) 0, (iv) 5

6. 0

7. (i) $x = \pm\sqrt{3}$, (ii) $x = 2$

8. (B)

EXERCISE 4.2

15. C

16. C

EXERCISE 4.3

1. (i) $\frac{15}{2}$, (ii) $\frac{47}{2}$, (iii) 15
 3. (i) 0, 8, (ii) 0, 8 4. (i) $y = 2x$, (ii) $x - 3y = 0$ 5. (D)

EXERCISE 4.4

1. (i) $M_{11} = 3, M_{12} = 0, M_{21} = -4, M_{22} = 2, A_{11} = 3, A_{12} = 0, A_{21} = 4, A_{22} = 2$
 (ii) $M_{11} = d, M_{12} = b, M_{21} = c, M_{22} = a$
 $A_{11} = d, A_{12} = -b, A_{21} = -c, A_{22} = a$
 2. (i) $M_{11} = 1, M_{12} = 0, M_{13} = 0, M_{21} = 0, M_{22} = 1, M_{23} = 0, M_{31} = 0, M_{32} = 0, M_{33} = 1,$
 $A_{11} = 1, A_{12} = 0, A_{13} = 0, A_{21} = 0, A_{22} = 1, A_{23} = 0, A_{31} = 0, A_{32} = 0, A_{33} = 1$
 (ii) $M_{11} = 11, M_{12} = 6, M_{13} = 3, M_{21} = -4, M_{22} = 2, M_{23} = 1, M_{31} = -20, M_{32} = -13, M_{33} = 5$
 $A_{11} = 11, A_{12} = -6, A_{13} = 3, A_{21} = 4, A_{22} = 2, A_{23} = -1, A_{31} = -20, A_{32} = 13, A_{33} = 5$
 3. 7 4. $(x - y)(y - z)(z - x)$ 5. (D)

EXERCISE 4.5

1. $\begin{bmatrix} 4 & -2 \\ -3 & 1 \end{bmatrix}$ 2. $\begin{bmatrix} 3 & 1 & -11 \\ -12 & 5 & -1 \\ 6 & 2 & 5 \end{bmatrix}$ 5. $\frac{1}{14} \begin{bmatrix} 3 & 2 \\ -4 & 2 \end{bmatrix}$
 6. $\frac{1}{13} \begin{bmatrix} 2 & -5 \\ 3 & -1 \end{bmatrix}$ 7. $\frac{1}{10} \begin{bmatrix} 10 & -10 & 2 \\ 0 & 5 & -4 \\ 0 & 0 & 2 \end{bmatrix}$ 8. $\frac{-1}{3} \begin{bmatrix} -3 & 0 & 0 \\ 3 & -1 & 0 \\ -9 & -2 & 3 \end{bmatrix}$
 9. $\frac{-1}{3} \begin{bmatrix} -1 & 5 & 3 \\ -4 & 23 & 12 \\ 1 & -11 & -6 \end{bmatrix}$ 10. $\begin{bmatrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{bmatrix}$ 11. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos \alpha & \sin \alpha \\ 0 & \sin \alpha & -\cos \alpha \end{bmatrix}$
 13. $\frac{1}{7} \begin{bmatrix} 2 & -1 \\ 1 & 3 \end{bmatrix}$ 14. $a = -4, b = 1$ 15. $A^{-1} = \frac{1}{11} \begin{bmatrix} -3 & 4 & 5 \\ 9 & -1 & -4 \\ 5 & -3 & -1 \end{bmatrix}$

$$16. \frac{1}{4} \begin{bmatrix} 3 & 1 & -1 \\ 1 & 3 & 1 \\ -1 & 1 & 3 \end{bmatrix}$$

17. B

18. B

EXERCISE 4.6

1. Consistent

2. Consistent

3. Inconsistent

4. Consistent

5. Inconsistent

6. Consistent

7. $x = 2, y = -3$

8. $x = \frac{-5}{11}, y = \frac{12}{11}$

9. $x = \frac{-6}{11}, y = \frac{-19}{11}$

10. $x = -1, y = 4$

11. $x = 1, y = \frac{1}{2}, z = \frac{-3}{2}$

12. $x = 2, y = -1, z = 1$

13. $x = 1, y = 2, z = -1$

14. $x = 2, y = 1, z = 3$

$$15. \begin{bmatrix} 0 & 1 & -2 \\ -2 & 9 & -23 \\ -1 & 5 & -13 \end{bmatrix}, x = 1, y = 2, z = 3$$

16. cost of onions per kg = ₹ 5
 cost of wheat per kg = ₹ 8
 cost of rice per kg = ₹ 8

Miscellaneous Exercise on Chapter 4

3. 1

5. $x = \frac{-a}{3}$

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

9. $-2(x^3 + y^3)$

10. xy

16. $x = 2, y = 3, z = 5$

17. A

18. A

19. D