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Answers Key:

1. $\begin{vmatrix} 0 & 1 & 0 \\ x & 2 & x \\ 1 & 3 & x \end{vmatrix} = 0 \Rightarrow -1\left[x^2 - x\right] = 0$
   $\Rightarrow x(x-1) = 0 \Rightarrow x = 0, 1$
2. $\begin{vmatrix} 2x+y & x & y \\ 2y+z & y & z \\ 2z+x & z & x \end{vmatrix}$ $c_1 \to c_1 - c_3$
   $\begin{vmatrix} 2x & x & y \\ 2y & y & z \\ 2z & z & x \end{vmatrix} = 0$ $c_1 \sim c_3$
3. இணைக் காரணி $-7 = \begin{vmatrix} 2 & -3 \\ 6 & 0 \end{vmatrix} = 0 + 18 = 18$
4. (b) -Δ
5. (c) $a^2b^2c^2$
6. (c) $k^3|A|$
7. (c) adj B adj A
8. (c) $\frac{30}{7}\begin{pmatrix} \frac{1}{2} & \frac{-5}{12} \\ \frac{-2}{5} & \frac{1}{5} \end{pmatrix}$
9. $|A| = \frac{1}{ad-bc}$; $A^{-1} = \frac{1}{ad-bc}\begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$
10. (d) 2
11. (c) பேராசிரியர் வேஸ்லி. W. லியோன்டிப்
12. |A|=4-4=0
13. $|A| = 6 - 5 = 1$
    $A^{-1} = \begin{pmatrix} 2 & -1 \\ -5 & 3 \end{pmatrix}$
14. $|A| = 4 - 2 = 2$
    $A(\text{adj } A) = |A|I = \begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}$
15. $X=A^{-1}B$
16. $R_2 \sim R_3$
17. (b) $\frac{1}{det(A)}$
18. (d) 4
19. $|\text{adj } A| = |A|^{n-1}n = 3$
    $= |3|^2 = 9$
20. $\begin{vmatrix} x & x^2 & 1 \\ y & y^2 & 1 \\ z & z^2 & 1 \end{vmatrix} + \begin{vmatrix} x & -yz & 1 \\ y & -zx & 1 \\ z & -xy & 1 \end{vmatrix}$
    R_1, R_2, R_3,
    $\begin{vmatrix} x & x^2 & 1 \\ y & y^2 & 1 \\ z & z^2 & 1 \end{vmatrix} - \frac{1}{xyz}\begin{vmatrix} x^2 & xyz & x \\ y^2 & xyz & y \\ z^2 & xyz & z \end{vmatrix}$
    $= \begin{vmatrix} x & x^2 & 1 \\ y & y^2 & 1 \\ z & z^2 & 1 \end{vmatrix} - \frac{xyz}{xyz}\begin{vmatrix} x^2 & 1 & x \\ y^2 & 1 & y \\ z^2 & 1 & z \end{vmatrix}$
    $= \begin{vmatrix} x & x^2 & 1 \\ y & y^2 & 1 \\ z & z^2 & 1 \end{vmatrix} - \begin{vmatrix} x & x^2 & 1 \\ y & y^2 & 1 \\ z & z^2 & 1 \end{vmatrix} = 0$
21. $|A| = \cos^2\theta + \sin^2\theta = 1$
    $|2A| = 2^2(1) = 4$
22. (d) $a_{11}A_{11}+a_{21}A_{21}+a_{31}A_{31}$
23. 5x - 16 = 0
    5x = 16
    $x = \frac{16}{5}$
24. $\begin{vmatrix} 20 & 15 \\ 15 & 5 \end{vmatrix} = 5 \times 5\begin{vmatrix} 4 & 3 \\ 3 & 1 \end{vmatrix}$
    $= 5 \times 5 \times -5$
    $= -125$
25. (a) 0