

①

$$\det \begin{bmatrix} 1 & -1 & 2 & -1 \\ 2 & 1 & -2 & -2 \\ -1 & 2 & -4 & 1 \\ 3 & 0 & 0 & -3 \end{bmatrix}$$

①

$$\begin{aligned} x - y + 2z - w &= -1 \\ 2x + y - 2z - 2w &= -2 \\ -x + 2y - 4z + w &= 1 \\ 3x &\quad - 3w = -3 \end{aligned}$$

NO SOLUTION

②

$$\det \begin{bmatrix} 0 & -1 & -2 & -3 \\ 1 & 1 & 4 & 4 \\ 1 & 3 & 7 & 9 \\ -1 & -2 & -4 & -6 \end{bmatrix} \quad D$$

$$\det \begin{bmatrix} 0 & -1 & -2 & -3 \\ 7 & 1 & 4 & 4 \\ 4 & 3 & 7 & 9 \\ 6 & -2 & -4 & -6 \end{bmatrix} \quad D_w$$

$$\det \begin{bmatrix} 0 & 0 & -2 & -3 \\ 1 & 7 & 4 & 4 \\ 1 & 4 & 7 & 9 \\ -1 & 6 & -4 & -6 \end{bmatrix} \quad D_x$$

$$\det \begin{bmatrix} 0 & -1 & 0 & -3 \\ 1 & 1 & 7 & 4 \\ 1 & 3 & 4 & 9 \\ -1 & -2 & 6 & -6 \end{bmatrix} \quad D_y$$

$$\det \begin{bmatrix} 0 & -1 & -2 & 0 \\ 1 & 1 & 4 & 7 \\ 1 & 3 & 7 & 4 \\ -1 & -2 & -4 & 6 \end{bmatrix} \quad D_z$$

$$w = \frac{D_w}{D} = \frac{-6}{1} = -6$$

$$x = \frac{D_x}{D} = \frac{1}{1} = 1$$

$$y = \frac{D_y}{D} = \frac{10}{1} = 10$$

$$z = \frac{D_z}{D} = \frac{-7}{1} = -7$$

③

$$\begin{aligned} a + b - 2c + d + 3e - f &= 4 \\ 2a - b + c + 2d + e - 3f &= 20 \\ a + 3b - 3c - d + 2e + f &= -15 \\ 5a + 2b - c - d + 2e + f &= -3 \\ -3a - b + 2c + 3d + e + 3f &= 16 \\ 4a + 3b + c - 6d - 3e - 2f &= -27 \end{aligned}$$

$$\det \begin{pmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 2 & -1 & 1 & 2 & 1 & -3 \\ 1 & 3 & -3 & -1 & 2 & 1 \\ 5 & 2 & -1 & -1 & 2 & 1 \\ -3 & -1 & 2 & 3 & 1 & 3 \\ 4 & 3 & 1 & -6 & -3 & -2 \end{pmatrix} = -852$$

$$= D$$

$$A = 1$$

$$\frac{D_A}{D} = \frac{-852}{-852}$$

$$\det \begin{pmatrix} 4 & 1 & -2 & 1 & 3 & -1 \\ 20 & -1 & 1 & 2 & 1 & -3 \\ -15 & 3 & -3 & -1 & 2 & 1 \\ -3 & 2 & -1 & -1 & 2 & 1 \\ 16 & -1 & 2 & 3 & 1 & 3 \\ -27 & 3 & 1 & -6 & -3 & -2 \end{pmatrix} = -852$$

$$= D_A$$

$$\det \begin{pmatrix} 1 & 4 & -2 & 1 & 3 & -1 \\ 2 & 20 & 1 & 2 & 1 & -3 \\ 1 & -15 & -3 & -1 & 2 & 1 \\ 5 & -3 & -1 & -1 & 2 & 1 \\ -3 & 16 & 2 & 3 & 1 & 3 \\ 4 & -27 & 1 & -6 & -3 & -2 \end{pmatrix} = 1704$$

Ans/-852
-2

$$= D_B$$

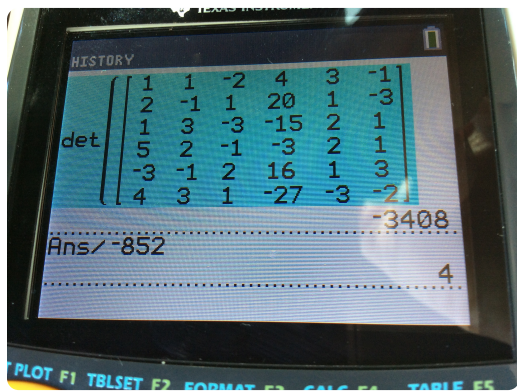
$$B = -2$$

$$\det \begin{pmatrix} 1 & 1 & 4 & 1 & 3 & -1 \\ 2 & -1 & 20 & 2 & 1 & -3 \\ 1 & 3 & -15 & -1 & 2 & 1 \\ 5 & 2 & -3 & -1 & 2 & 1 \\ -3 & -1 & 16 & 3 & 1 & 3 \\ 4 & 3 & -27 & -6 & -3 & -2 \end{pmatrix} = -2556$$

Ans/-852
3

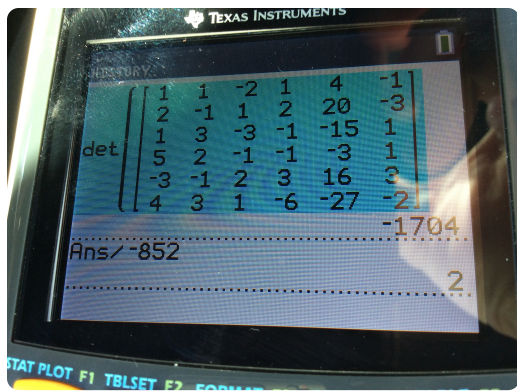
$$= D_C$$

$$C = 3$$



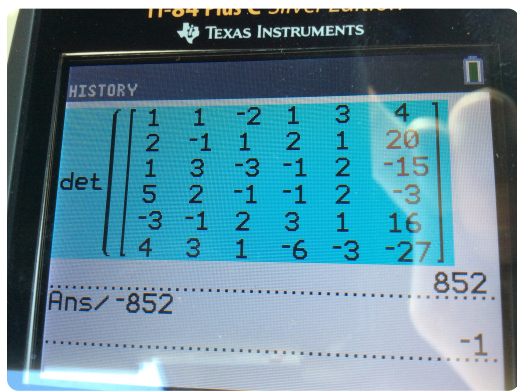
$$= D_D$$

$$D=4$$



$$D_E$$

$$E=2$$



$$= D_F$$

$$F=-1$$