Chapter 6 Determinants Ex 6.4 Q9

$$\text{Let } D = \begin{vmatrix} 9 & 5 \\ -2 & 3 \end{vmatrix} = 37$$

$$D_1 = \begin{vmatrix} 10 & 5 \\ 8 & 3 \end{vmatrix} = -10$$

$$D_2 = \begin{vmatrix} 9 & 10 \\ -2 & 8 \end{vmatrix} = 92$$

$$x = \frac{D_1}{D} = \frac{-10}{37}$$

$$y = \frac{D_2}{D} = \frac{92}{37}$$

Chapter 6 Determinants Ex 6.4 Q10

$$\text{Let } D = \begin{vmatrix} 1 & 2 \\ 3 & 1 \end{vmatrix} = -5$$

$$D_1 = \begin{vmatrix} 1 & 2 \\ 4 & 1 \end{vmatrix} = -7$$

$$D_2 = \begin{vmatrix} 1 & 1 \\ 3 & 4 \end{vmatrix} = 1$$

$$x = \frac{D_1}{D} = \frac{7}{5}$$

$$y = \frac{D_2}{D} = \frac{-1}{5}$$

Chapter 6 Determinants Ex 6.4 Q11

$$\text{Let } D = \begin{vmatrix} 3 & 1 & 1 \\ 2 & -4 & 3 \\ 4 & 1 & -3 \end{vmatrix}$$

Expanding along R_1

$= 3(9) + (-1)(-18) + 1(18)$

$= 27 + 18 + 18 = 63$

$$\text{Again } D_1 = \begin{vmatrix} 2 & 1 & 1 \\ -1 & -4 & 3 \\ -11 & 1 & -3 \end{vmatrix}$$

Expanding along R_1

$= 2(9) + (-1)(36) + 1(-45)$

$= 18 - 36 - 45 = -63$

$$\text{Again } D_2 = \begin{vmatrix} 3 & 2 & 1 \\ 2 & -1 & 3 \\ 4 & -11 & -3 \end{vmatrix}$$

Expanding along R_1 $= 3(3 + 33) - 2(-18) + 1(-22 + 4)$

$= 108 + 36 - 18 = 126$

$$\text{Also } D_3 = \begin{vmatrix} 3 & 1 & 2 \\ 2 & -4 & -1 \\ 4 & 1 & -11 \end{vmatrix}$$

Expanding along R_1

$= 3(45) - 1(-18) + 2(18) = 135 + 18 + 36 = 189$

Now $x = \frac{D_1}{D} = \frac{-63}{63} = -1$

$y = \frac{D_2}{D} = \frac{126}{63} = 2$

$z = \frac{D_3}{D} = \frac{189}{63} = 3$

Chapter 6 Determinants Ex 6.4 Q12

$$\text{Let } D = \begin{vmatrix} 1 & -4 & -1 \\ 2 & -5 & 2 \\ -3 & 2 & 1 \end{vmatrix}$$

Expanding along R_1

$$= 1(-9) + 4(8) - 1(-11) = -9 + 32 + 11 = 34$$

$$\text{Again } D_1 = \begin{vmatrix} 11 & -4 & -1 \\ 39 & -5 & 2 \\ 1 & 2 & 1 \end{vmatrix}$$

Expanding along R_1

$$= 11(-9) + 4(37) - 1(83) \qquad = -99 + 148 - 83$$
$$= 148 - 182$$
$$= -34$$

$$\text{Also } D_2 = \begin{vmatrix} 1 & 11 & -1 \\ 2 & 39 & 2 \\ -3 & 1 & 1 \end{vmatrix}$$

Expanding along R_1

$$= 1(37) - 11(8) - 1(119)$$
$$= 37 - 88 - 119 = -170$$

$$\text{Also } D_3 = \begin{vmatrix} 1 & -4 & 11 \\ 2 & -5 & -39 \\ -3 & 2 & 1 \end{vmatrix}$$

Expanding along R_1

$$= 1(-5 - 78) + 4(2 + 117) + 11(4 - 15)$$
$$= -83 + 476 - 121 = 272$$

Now $\quad x = \dfrac{D_1}{D} = \dfrac{-34}{34} = -1$

$$y = \frac{D_2}{D} = \frac{-170}{34} = -5$$

$$z = \frac{D_3}{D} = \frac{272}{34} = 8$$

Hence $x = -1, y = -5, z = 8$

********** END **********