Apply $C_2 \to y\,C_2$ and $C_3 \to z\,C_3$

$$=\frac{(x+y+z)^2}{yz}\begin{vmatrix} 2yz & -2yz & -2yz \\ y^2 & (yz+yx-y^2) & 0 \\ z^2 & 0 & (zx+zy-z^2) \end{vmatrix}$$ 1

Apply $C_2 \to C_2+C_1$ and $C_3 \to C_3+C_1$

$$=\frac{(x+y+z)^2}{yz}\begin{vmatrix} 2yz & 0 & 0 \\ y^2 & (yz+yx) & y^2 \\ z^2 & z^2 & (zx+zy) \end{vmatrix}$$ 1

expanding along R_1

$$=\left(\frac{(x+y+z)^2}{yz}\right)2yz[(yz+yx)(zx+zy)-y^2z^2]$$

$$=2(x+y+z)^2[xyz^2+x^2yz+xy^2z+y^2z^2-y^2z^2]$$

$$=2xyz(x+y+z)^2(x+y+z)$$ 1

$$=2xyz(x+y+z)^3$$

OR

$$\text{** } A=\begin{bmatrix} 2 & 3 & 4 \\ 1 & -1 & 0 \\ 0 & 1 & 2 \end{bmatrix}$$

$$|A| = 2(-2)-3(2-0)+4(1-0) = -6 \neq 0$$

$$\therefore A^{-1} \text{exists}$$

Cofactors

$A_{11}=-2$ $A_{12}=-2$ $A_{13}=1$

$A_{21}=-2$ $A_{22}=4$ $A_{23}=-2$

$A_{31}=4$ $A_{32}=4$ $A_{33}=-5$ 2

$$Adj\ A=\begin{bmatrix} -2 & -2 & 1 \\ -2 & 4 & -2 \\ 4 & 4 & -5 \end{bmatrix}'$$

$$Adj\ A=\begin{bmatrix} -2 & -2 & 4 \\ -2 & 4 & 4 \\ 1 & -2 & -5 \end{bmatrix}$$

$$A^{-1}=\frac{Adj\ A}{|A|}=\frac{1}{-6}\begin{bmatrix} -2 & -2 & 4 \\ -2 & 4 & 4 \\ 1 & -2 & -5 \end{bmatrix}$$ 1

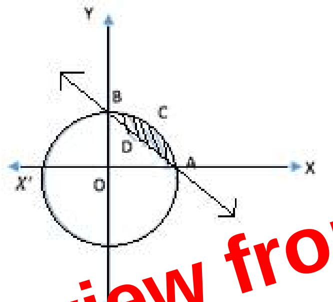
System of equations can be written as $AX=B$ $\frac{1}{2}$

Where $A=\begin{bmatrix} 2 & 3 & 4 \\ 1 & -1 & 0 \\ 0 & 1 & 2 \end{bmatrix}, X=\begin{bmatrix} x \\ y \\ z \end{bmatrix}, B=\begin{bmatrix} 17 \\ 3 \\ 7 \end{bmatrix}$

Now $AX=B$

$$\Rightarrow X=A^{-1}B$$

$$\Rightarrow X=\frac{1}{-6}\begin{bmatrix} -2 & -2 & 4 \\ -2 & 4 & 4 \\ 1 & -2 & -5 \end{bmatrix}\begin{bmatrix} 17 \\ 3 \\ 7 \end{bmatrix}$$

	$\Rightarrow X = \frac{1}{-6}\begin{bmatrix} -34-6+28 \\ -34+12+28 \\ 17-6-35 \end{bmatrix}$ $\Rightarrow X = \frac{1}{-6}\begin{bmatrix} -12 \\ 6 \\ -24 \end{bmatrix}$ $\Rightarrow X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 2 \\ -1 \\ 4 \end{bmatrix}$ $\Rightarrow x = 2, \quad y = -1, \quad z = 4$	$1\frac{1}{2}$
34	$x^2 + y^2 = 1$……………….(1) $x + y = 1$…………………..(2) solving (1) and(2) $x^2 + (1-x)^2 = 1$ $x^2 + x^2 - 2x + 1 = 1$ $2x^2 - 2x = 0$ $2x(x-1) = 0$ $x = 0 \; or \; x = 1$  Required area = shaded area ACBDA =area(OACBO)– area(OADBO) $=\int_0^1 (y_{circle} - y_{line})dx$ $\int_0^1 \sqrt{1-x^2}dx - \int_0^1 (1-x)dx$ $=\left[\frac{x\sqrt{1-x^2}}{2} + \frac{1}{2}\sin^{-1}x\right]_0^1 - \left[x - \frac{x^2}{2}\right]_0^1$ $\left[\left(0+\frac{1}{2}.\frac{\pi}{2}\right)-0\right] - \left[\left(1-\frac{1}{2}\right)\right]$ $\left(\frac{\pi}{4} - \frac{1}{2}\right)$ square units	1 1 1 $1\frac{1}{2}$ $1\frac{1}{2}$
35	Let r be the radius and $h$be the height of half cylinder Volume $=\frac{1}{2}\pi r^2 h = V$(constant)……………..(1)	$\frac{1}{2}(fig)$