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15855

BBA-A

BASIC MATHEMATICS. (FINAL)

QUESTION NO : 1.

a. Divide $x^3 + 6x^2 + 11x + 6$ by $(x+3)$.

$$\begin{array}{r}
 x^2 + 3x + 2 \\
 x+3 \overline{) x^3 + 6x^2 + 11x + 6} \\
 \underline{\pm x^3 \pm 3x^2} \\
 3x^2 + 11x + 6 \\
 \underline{\pm 3x^2 \pm 9x} \\
 2x + 6 \\
 \underline{\pm 2x \pm 6} \\
 0
 \end{array}$$

Ansb. Factorize $6x^2 + 23x + 7$.

Solution

$$\begin{array}{l}
 6x^2 + 23x + 7 \\
 6x^2 + 2x + 21x + 7 \\
 2x(3x+1) + 7(3x+1) \\
 (3x+1)(2x+7)
 \end{array}$$

Ans

c. Simplify the following.

$$\frac{4}{x+2} + \frac{7}{x^2+3x+2}$$

Solution

$$\frac{4}{x+2} + \frac{7}{x^2+3x+2}$$

$$\frac{4}{x+2} + \frac{7}{x^2+2x+x+2}$$

$$\frac{4}{x+2} + \frac{7}{x(x+2) + 1(x+2)}$$

$$\frac{4}{x+2} + \frac{7}{(x+2)(x+2)}$$

$$\frac{(x+1)4 + 7}{(x+2)(x+1)}$$

$$\frac{4x+4+7}{(x+2)(x+1)}$$

$$= \frac{4(\cancel{x+1}) + 7}{(x+2)(\cancel{x+1})}$$

$$= \frac{4+7}{(x+2)}$$

$$\Rightarrow \frac{11}{x+2}$$

②
a) $\frac{27}{2} = \boxed{13.50} \rightarrow$ equivalent decimal

Converting fraction into Percentage:-

$$\frac{27}{2} \times 100 \Rightarrow \boxed{1350\%}$$

b) $\Rightarrow \frac{18}{450} \times 100$
 $\Rightarrow 4\%$

$$\boxed{18 \text{ is } 4\% \text{ of } 450}$$

c) Selling Price = 1500

Let the cost is C

$$\Rightarrow \text{gross profit} = \frac{2}{3}C$$

$$\Rightarrow \text{profit} = (\text{selling price}) - (\text{cost})$$

$$\Rightarrow \frac{2}{3}C = 1500 - C$$

$$\Rightarrow \frac{5}{3}C = 1500$$

$$\Rightarrow \boxed{C = 900 \text{ Rs.}}$$

$$\boxed{\text{profit} = \frac{2}{3} \times 900 \Rightarrow 600 \text{ Rs.}}$$

Cost

3

a

$$AB = \begin{bmatrix} 2 & 4 & 7 \\ 5 & 3 & 1 \end{bmatrix} \begin{bmatrix} 3 & 9 \\ 2 & 4 \end{bmatrix}$$

~~AB is not possible~~

AB matrix is not possible because order of matrix A is (2×3) and that of B is (2×2) .

for AB to be possible, Number of columns in matrix A and number of rows in matrix B should be equal. But here, number of columns in matrix A ^{are} three and number of rows in matrix B are two.

$$\Rightarrow BA = \begin{bmatrix} 3 & 9 \\ 2 & 4 \end{bmatrix} \begin{bmatrix} 2 & 4 & 7 \\ 5 & 3 & 1 \end{bmatrix}$$

$$BA = \begin{bmatrix} (3 \times 2 + 9 \times 5) & (3 \times 4 + 9 \times 3) & (3 \times 7 + 9 \times 1) \\ (2 \times 2 + 4 \times 5) & (2 \times 4 + 4 \times 3) & (2 \times 7 + 4 \times 1) \end{bmatrix}$$

$$BA = \begin{bmatrix} 51 & 39 & 30 \\ 24 & 20 & 18 \end{bmatrix}_{2 \times 3}$$

b

$$\begin{vmatrix} 2 & 2 & 0 \\ -2 & 1 & 2 \\ 2 & 1 & 0 \end{vmatrix} = 2(1 \times 0 - 1 \times 2) - 2(-2 \times 0 - 2 \times 2) + 0(-2 \times 1 - 2 \times 1)$$

$$\Rightarrow \boxed{4}$$

③

$$3x + y = 5$$

$$6x - y = 6$$

$$\Rightarrow D = \begin{vmatrix} 3 & 1 \\ 6 & -1 \end{vmatrix}$$

$$D = 3 \times (-1) - (6 \times 1)$$

$$(D = -9)$$

$$\Rightarrow D_x = \begin{vmatrix} 5 & 1 \\ 6 & -1 \end{vmatrix}$$

$$D_x = 5 \times (-1) - (6 \times 1)$$

$$(D_x = -11)$$

$$\Rightarrow D_y = \begin{vmatrix} 3 & 5 \\ 6 & 6 \end{vmatrix}$$

$$D_y = (3 \times 6) - (5 \times 6)$$

$$(D_y = -12)$$

Solution of the equations:-

$$x = \frac{D_x}{D} \Rightarrow \frac{-11}{-9} \Rightarrow \frac{11}{9}$$

$$y = \frac{D_y}{D} \Rightarrow \frac{-12}{-9} \Rightarrow \frac{4}{3}$$

$$(x, y) : \left(\frac{11}{9}, \frac{4}{3} \right)$$

$$\textcircled{1} \quad 2x + y + z = 5 \quad \text{--- (1)}$$

$$3x - 2y - z = 11 \quad \text{--- (2)}$$

$$3x + 8 + 2z = 11 \quad \text{--- (3)}$$

Using equation (1) :-

$$2x + y + z = 5$$

$$(y = -2x - z + 5)$$

Substituting this value of y in equation (2) & (3)

$$\Rightarrow 3x - 2(-2x - z + 5) - z = 11$$

$$3x + 4x + 2z - 10 - z = 11$$

$$7x + z = 21 \quad \text{--- (4)}$$

$$\Rightarrow 3x + (-2x - z + 5) + 2z = 11$$

$$x + z = 6 \quad \text{--- (5)}$$

$$z = (6 - x)$$

Substituting this value of z in equation (4) :-

$$\Rightarrow 7x + (6 - x) = 21$$

$$6x = 15$$

$$\boxed{x = 2.5}$$

$$z = 6 - x$$

$$z = 6 - 2.5$$

$$\boxed{z = 3.5}$$

Putting $x = 2.5$ and $z = 3.5$ in equation (3) —

$$\Rightarrow (3 \times 2.5) + y + (2 \times 3.5) = 11$$

$$y = -3.5$$

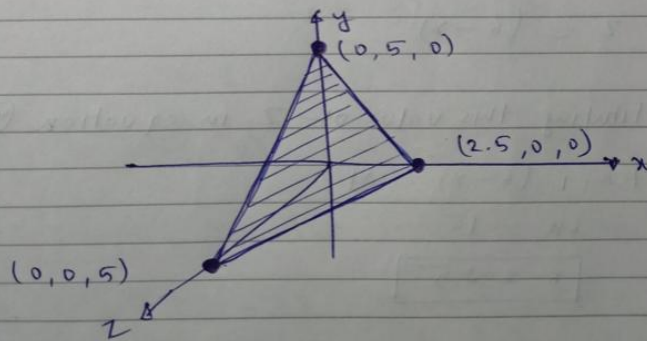
$$(x, y, z) : (2.5, -3.5, 3.5)$$

⇒ Graphically Drawing the lines! —

$$\Rightarrow 2x + y + z = 5$$

$$\Rightarrow \frac{2x}{5} + \frac{y}{5} + \frac{z}{5} = 1$$

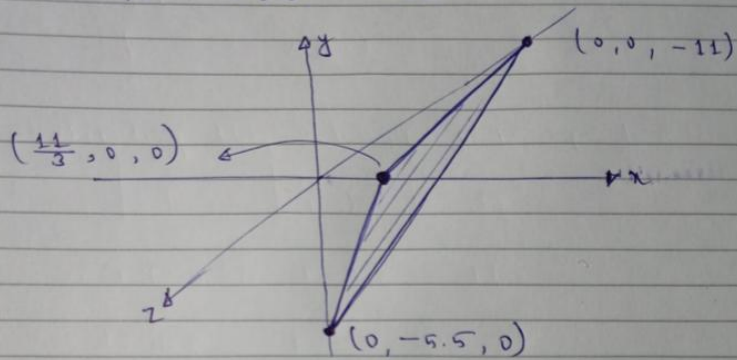
$$\Rightarrow \frac{x}{2.5} + \frac{y}{5} + \frac{z}{5} = 1$$



$$\Rightarrow 3x - 2y - z = 11$$

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

$$\frac{x}{11/3} + \frac{y}{-5.5} + \frac{z}{-11} = 1$$



$$\Rightarrow 3x + y + 2z = 11$$

$$\frac{x}{11/3} + \frac{y}{11} + \frac{z}{5.5} = 1$$

