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Where Minds Pollinate

Class 12
Mathematics

Chapter 6
Exercise 6.3
Handwritten Solution

Follow Our Socials



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Exercise 6.3

Q1, 5, 6

100% Same

(1)

$$l_1: 2x - y - 14 = 0$$

$$l_2: x + y - 1 = 0$$

$$l_3: 3x + 2y - 7 = 0$$

Solution:-

$$\begin{vmatrix} 2 & -1 & -14 \\ 1 & 1 & -1 \\ 3 & 2 & -7 \end{vmatrix}$$

$$= 2(-7+2) + 1(-7+3) - 14(2-3)$$

$$= -10 - 4 + 14$$

$$= \boxed{0} \text{ Answer}$$

Yes, The jets will pass through single Point

Point:-

For point of concurrency
solve l_1 & l_2

$$2x - y - 14 = 0$$

$$x + y - 1 = 0$$

$$\hline 3x - 15 = 0$$

$$\boxed{x=5} \text{ put in } l_2$$

$$5 + y - 1 = 0$$

$$\boxed{y = -4}$$

So point of concurrency is $P(x, y) = P(5, -4)$

(5)

Answer

$$l_1: 2x + y - 11.5 = 0$$

$$l_2: x - 4y + 1 = 0$$

$$l_3: 3x - 2y - 12 = 0$$

point of concurrency & convergence same.
 7 sandabat

$$\begin{vmatrix} 2 & 1 & -11.5 \\ 1 & -4 & 1 \\ 3 & -2 & -12 \end{vmatrix}$$

0 Yes three roads converge at a point
 Solving (1) & (2)

$$\begin{aligned} 2x + y - 11.5 &= 0 \\ 12x + 8y + 2 &= 0 \\ 9y - 13.5 &= 0 \\ y &= 1.5 \end{aligned}$$

put $y = 1.5$ in (1) -
 $2x + 1.5 - 11.5 = 0$
 $2x - 10 = 0$

$$x = 5$$

so point of convergence $P(5, 1.5)$

(6)

$$\begin{aligned} \text{Let } l_1 &= 2x + y - 23 = 0 \\ l_2 &= 0.5x - y + 3 = 0 \\ l_3 &= x - y = 1 \end{aligned}$$

$$\begin{vmatrix} 2 & 1 & -23 \\ 0.5 & -1 & 3 \\ 1 & -1 & -1 \end{vmatrix}$$

= 0

Point $2x + y - 23 = 0$
 $x - y - 1 = 0$
 $3x - 24 = 0$
 $x = \frac{24}{3}$

$$x = 8$$

put $x = 8$ in (3)

$$\begin{aligned} 8 - y &= 1 \\ -y &= 1 - 8 \end{aligned}$$

$$y = 7$$

$P(8, 7)$

Q2.

as Q7

X(3,7), Y(6,2) Z(10,8)

As

Area of $\Delta XYZ =$

$$\frac{1}{2} \begin{vmatrix} 3 & 7 & 1 \\ 6 & 2 & 1 \\ 10 & 8 & 1 \end{vmatrix}$$

$$= \frac{1}{2} (3(-6) - 7(-4) + 1(28))$$

$$= \frac{1}{2} (38) \Rightarrow 19 \text{ square units}$$

Rate per sq. unit = Rs 300

$$\text{Cost of 19 sq unit} = 300 \times 19 \Rightarrow \text{Rs } 5700$$

Q3.

P(4,1)

Q(9,5)

R(7,10)

$$\text{Area} = \frac{1}{2} \begin{vmatrix} 4 & 1 & 1 \\ 9 & 5 & 1 \\ 7 & 10 & 1 \end{vmatrix}$$

$$= \frac{1}{2} (33) = 16.5 \text{ sq unit}$$

Q4

A(1,4) B(5,4) C(8,6)

$$\text{Area} = \frac{1}{2} \begin{vmatrix} 1 & 4 & 1 \\ 5 & 4 & 1 \\ 8 & 6 & 1 \end{vmatrix}$$

$$= 14.5 \text{ sq unit}$$

$$\text{total cost of planting mango trees} = 14.5 \times 70$$

$$= \text{Rs } 1015$$

(Q8)

Sol

$$3x^2 - 4xy + y^2 = 0$$

$$3x^2 - 3xy - xy + y^2 = 0$$

$$3x(x-y) - y(x-y) = 0$$

$$(x-y)(3x-y) = 0$$

$$x-y=0 ; 3x-y=0$$

paths
are lines of required
individual light rays

For angle:-

$$3x^2 - 4xy + y^2 = 0$$

comp are with $ax^2 + 2hxy + by^2 = 0$

$$a=3 \quad h=-2 \quad b=1$$

$$\tan \theta = \frac{2\sqrt{h^2 - ab}}{a+b}$$

$$= \frac{2\sqrt{4-3}}{4}$$

$$\tan \theta = \frac{1}{2}$$

$$\theta = \tan^{-1}\left(\frac{1}{2}\right) \Rightarrow \boxed{\theta = 26.5^\circ} \text{ answer}$$

(Q9)

$$2x^3 - 8xy^2 = 0$$

$$2x(x^2 - 4y^2) = 0$$

÷ bs by 2

$$x(x+2y)(x-2y) = 0$$

$$x=0, x+2y=0, x-2y=0$$

the required eqs of iron beams

Q7

~~Q14~~ $l_1: x+y-4=0$

$$l_2: 2x-y-2=0$$

$$l_3: x-2y+2=0$$

$$\begin{array}{ccc|c} 1 & 1 & -4 & 0 \\ 2 & -1 & -2 & 0 \\ 1 & -2 & +2 & 0 \end{array}$$

Solving (1) & (2)

$$x+y-4=0$$

$$2x-y-2=0$$

$$3x-6=0$$

$$\boxed{x=2} \text{ put } x=2 \text{ in (1)}$$

$$2+y-4=0$$

$$y-2=0$$

$$\boxed{y=2}$$

$$P(2,2) \text{ ans}$$