

## Chapter Determinants Ex 6.3 Q9

If the given points are collinear, then the area of the triangle must be zero.

so 
$$\frac{1}{2}\begin{vmatrix} k & 2-2k & 1\\ -k+1 & 2k & 1\\ -4-k & 6-2k & 1 \end{vmatrix} = 0$$

expanding along  $R_1$ 

$$k\left(2k-6+2k\right)-\left(2-2k\right)\left(-k+1+4+k\right)+1\left(1-k\right)\times\left(6-2k\right)-2k\left(-4-k\right)=0$$

$$k(4k-6)-(2-2k)(5)+1[6-2k-6k+2k^2+8k+2k^2]=0$$

$$4k^2 - 6k - 10 + 10k + 6 + 4k^2 = 0$$

$$8k^2 + 4k - 4 = 0$$

$$8k^2 + 8k - 4k - 4 = 0$$

(Middle term splitting)

$$8k(k+1) - 4(k+1) = 0$$

$$\left(8k-4\right)\left(k+1\right)=0$$

$$If 8k - 4 = 0$$

If 
$$8k - 4 = 0$$
 or if  $k + 1 = 0$ 

$$k = \frac{1}{2}$$

Hence 
$$k = -1, \frac{1}{2}$$

## Chapter Determinants Ex 6.3 Q10

Since the points are collinear, hence the area of the triangle must be zero.

so 
$$\frac{1}{2} \begin{vmatrix} x & -2 & 1 \\ 5 & 2 & 1 \\ 8 & 8 & 1 \end{vmatrix} = 0$$

or 
$$\times$$
 (-6) + 2(-3) + 1(24) = 0

or 
$$-6x - 6 + 24 = 0$$
  
 $-6x + 18 = 0$   
 $x = 3$ 

Hence x = 3

## Chapter Determinants Ex 6.3 Q11

Since the points are collinear, hence the area of the triangle must be zero.

$$\frac{1}{2} \begin{vmatrix} 3 & -2 & 1 \\ x & 2 & 1 \\ 8 & 8 & 1 \end{vmatrix} = 0$$

$$3(-6) + 2(x - 8) + 1(8x - 16) = 0$$

$$-18 + 2x - 16 + 8x - 16 = 0$$

$$10x = 50$$

$$x = 5$$

Hence x = 5

Chapter Determinants Ex 6.3 Q12(i)

Let A(x,y), B(1,2) and C(3,6) are 3 points in a line.

Since these points are collinear, hence area of the triangle must be zero.

$$\frac{1}{2} \begin{vmatrix} x & y & 1 \\ 1 & 2 & 1 \\ 3 & 6 & 1 \end{vmatrix} = 0$$

Expanding along  $R_1$ 

$$x(-4) - y(-2) + 1(0) = 0$$
  
 $-4x + 2y = 0$   
or  $2x - y = 0$   
or  $y = 2x$ 

Hence the equation is y = 2x

Chapter Determinants Ex 6.3 Q12(ii) Let A(x,y), B(3,1) and C(9,3) are 3 points in a line.

Since these points are collinear, hence the area of the triangle ABC must be zero.

$$\frac{1}{2} \begin{vmatrix} x & y & 1 \\ 3 & 1 & 1 \\ 9 & 3 & 1 \end{vmatrix} = 0$$

Expanding along  $R_1$ 

$$\times (-2) - y (-6) + 1 (0) = 0$$
  
 $-2x + 6y = 0$   
 $x - 3y = 0$ 

Hence the equation of the line is x - 3y = 0

\*\*\*\*\*\*\*\*\*\* END \*\*\*\*\*\*\*\*