

Ex 1.2

Q5 $A(0,0)$ $B(1,6)$ $C(-1, k+1)$ Area = 7.

$$\frac{1}{2} |(1)(k+1) - (-1)(6)| = 7$$

$$\frac{1}{2} |k+1+6| = 7$$

$$|k+7| = 14 \quad \text{sq both sides}$$

$$k^2 + 14k + 49 = 196$$

$$k^2 + 14k - 147 = 0$$

$$(k-7)(k+21) = 0$$

$$k = 7$$

$$k = -21$$

Q6 $A(4,1)$ $B(-1,-3)$ $C(3,k)$ Area = 12

$(5,4)$ $(0,0)$ $(4, k+3)$

$$\frac{1}{2} |(5)(k+3) - (4)(4)| = 12$$

$$\frac{1}{2} |5k+15-16| = 12$$

$$|5k-1| = 24$$

sq both sides

$$25k^2 - 10k + 1 = 576$$

$$25k^2 - 10k - 575 = 0$$

$$(5k+23)(5k-25)$$

$$k = -\frac{23}{5}$$

$$k = \frac{25}{5} = 5$$

Q7

$$|5h-1| = 24$$

$$5h-1 = 24$$

$$5h = 25$$

$$h = 5$$

$$5h-1 = -24$$

$$5h = -23$$

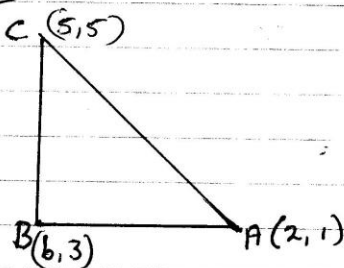
$$h = -\frac{23}{5}$$

Q8 $(0,0)$ $(1,3)$ $(2,6)$

$$\text{Area} = \frac{1}{2} |(1)(6) - (2)(3)| = \frac{1}{2} |6 - 6| = \frac{1}{2} |0| = 0$$

Area = 0 sq units \Rightarrow points are collinear.

Q10



$BC \perp BA \Rightarrow$ slopes

$$M_{BC} = \frac{5-3}{5-b} = \frac{2}{5-b}$$

$$M_{BA} = \frac{1-3}{2-b} = \frac{-2}{2-b}$$

$$M_1 \times M_2 = -1$$

$$\frac{2}{5-b} \times \frac{-2}{2-b} = -1$$

$$\frac{-4}{10-5b-2b+b^2} = -1$$

$$\frac{-4}{10-7b+b^2} = -1$$

$$-4 = -10 + 7b - b^2$$

$$b^2 - 7b + 6 = 0$$

$$(b-6)(b-1) = 0$$

$$b=6 \quad b=1 \quad \text{since } b > 3$$

Sol is $b=6$.

$$\begin{array}{ccc} A(2,1) & B(6,3) & C(5,5) \\ (0,0) & (4,2) & (3,4) \end{array}$$

$$\text{Area} = \frac{1}{2} |(4)(4) - (3)(2)| = \frac{1}{2} |16 - 6| = \frac{1}{2} |10| = 5 \text{ sq units}$$

Q11 $P(2, -1)$ $Q(8, k)$ $R(11, 2)$ are collinear
 $\Rightarrow \text{Area} = 0$

\downarrow
 $(0, 0)$ $(6, k+1)$ $(9, 3)$

$$\frac{1}{2} |(6)(3) - (9)(k+1)| = 0$$

$$|18 - 9k - 9| = 0$$

$$|9 - 9k| = 0 \quad \text{sq both sides}$$

$$81 - 162k + 81k^2 = 0 \quad (\div 81)$$

$$k^2 - 2k + 1 = 0$$

$$(k-1)(k-1) = 0$$

$$k = 1$$

Q12 $A(-2, 1)$ $B(1, 7)$ $C(3, 1)$
 (i) $(0, 0)$ $(3, 6)$ $(5, 0)$

$$\text{Area} = \frac{1}{2} |(3)(0) - (5)(6)| = \frac{1}{2} |0 - 30| = \frac{1}{2} |-30| = 15 \text{ sq units}$$

$$(ii) |BC| = \sqrt{(3-1)^2 + (1-7)^2} = \sqrt{2^2 + (-6)^2} = \sqrt{4+36} = \sqrt{40} = 2\sqrt{10}$$

$$(iii) \text{Area} = \frac{1}{2} \text{base} \times \text{height} = \frac{1}{2} (BC) \times (AL)$$

$$15 = \frac{1}{2} (2\sqrt{10}) (AL)$$

$$15 = \sqrt{10} |AL|$$

$$\frac{15}{\sqrt{10}} = |AL|$$

$$\frac{3\sqrt{10}}{2} = |AL|$$