

Test Yourself

A Questions

1. $3x - 2y + 6 = 0$ $m = \frac{-3}{-2} = \frac{3}{2} \Rightarrow m_{\perp} = -\frac{2}{3}$ ^{pt} $(-1, 4)$

$$y - 4 = -\frac{2}{3}(x + 1)$$

$$3y - 12 = -2x + 2$$

$$2x + 3y - 10 = 0$$

2. $(0, 0)$ $(3, -2)$ $(-2, 4)$

$$\text{Area} = \frac{1}{2} |(3)(4) - (-2)(-2)|$$

$$= \frac{1}{2} |12 - 4|$$

$$= \frac{1}{2} |8| = 4 \text{ sq units}$$

3. $(3, -2)$ $(1, 6)$ $m = \frac{6+2}{1-3} = \frac{8}{-2} = -4$ $m_{\perp} = \frac{1}{4}$

$$2x + ay + 7 = 0 \quad m = -\frac{2}{a}$$

$$-\frac{2}{a} = \frac{1}{4}$$

$$-8 = a$$

4. (b, a) $(-3, 6)$ $\frac{6-a}{-3-b} = \frac{6-a}{-9}$

$$\frac{6-a}{-9} = \frac{1}{3}$$

$$18 - 3a = -9$$

$$27 = 3a$$

$$9 = a$$

Q5 $y = \frac{3}{2}x - 2$

(i) $m = \frac{3}{2}$

(ii) cuts x @ $y = 0$ $0 = \frac{3}{2}x - 2$

$2 = \frac{3}{2}x$

$4 = 3x$

$\frac{4}{3} = x$

$(\frac{4}{3}, 0)$

cuts y @ $x = 0$

$y = -2$

$(0, -2)$

(iii) $(0, 0)$ $(\frac{4}{3}, 0)$ $(0, -2)$

Area = $\frac{1}{2} |(\frac{4}{3})(-2) - (0)(0)|$

= $\frac{1}{2} |-\frac{8}{3}|$

= $\frac{8}{6} = \frac{4}{3}$ sq units

Q6

(i) $m = \frac{\text{rise}}{\text{run}} = \frac{2}{5}$

(ii) $m = \frac{2}{5}$ $(1, 1)$

$y - 1 = \frac{2}{5}(x - 1)$

$5y - 5 = 2x - 2$

$2x - 5y + 3 = 0$

Q7

$y = k^2x - 12$

$m = k^2$

$2ky = 4x + 5$

$4x - 2ky + 5 = 0$

$m = \frac{-4}{-2k} = \frac{2}{k}$

lines \perp

$\Rightarrow k^2 = -\frac{k}{2}$

$k = \frac{-1}{2}$ ✓

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

Q7 contd

(ii) pt of $n \Rightarrow$ Sim eqns

$$y = \left(-\frac{1}{2}\right)^2 x + 2$$

$$y = \frac{1}{4}x + 12 \quad (x4)$$

$$2\left(-\frac{1}{2}\right)y = 4x + 5$$

$$-y = 4x + 5$$

$$x - 4y = -48$$

$$4x + y = -5 \quad (x4)$$

$$x - 4y = -48$$

$$16x + 4y = -20$$

$$17x = -68$$

$$x = -4$$

$$-y = 4(-4) + 5$$

$$-y = -16 + 5$$

$$-y = -11$$

$$y = 11$$

$(-4, 11)$

Q8 (i) $2x + y = 3 \quad m = -2/1 \quad x - 2y + 4 = 0 \quad m = \frac{1}{2} = \frac{1}{2}$
Yes

(ii) $m = 3 \quad \text{or} \quad m = -1/3 \quad \text{yes}$

(iii) $m = -2/1 \quad \text{or} \quad m = -1/2 = \frac{1}{2} \quad \text{yes}$
 $x - 2y + 4 = 0$

(iv) $m = -1/3 \quad \text{or} \quad m = -3/1 = \text{No. not opp. Sines}$

Q9

$$x + 2y - 3 = 0 \quad m = -1/2 \quad m_{\perp} = 2 \quad \text{pt}(5, 2)$$

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

$$y - 2 = 2x - 10$$

$$2x - y - 8 = 0$$

~~Q10 1 bisector \Rightarrow mid pt $(3, 3) \quad m = \frac{2}{4} = \frac{1}{2}$~~

~~$$y - 3 = \frac{1}{2}(x - 3)$$~~

~~cuts y at $x = 0$~~

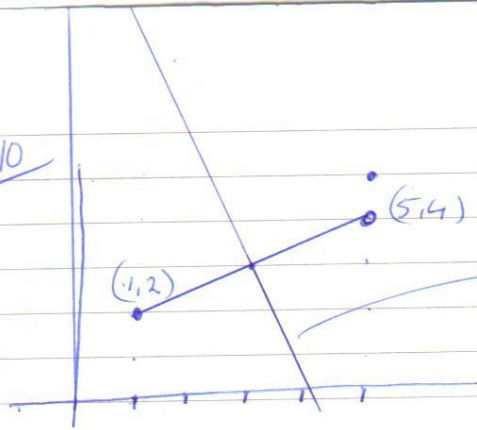
~~$$2y - 6 = x - 3$$~~

~~$$-2y = -3$$~~

~~$$x - 2y + 3 = 0$$~~

~~$$y = 3/2$$~~

Q10



find eqn.

$$\text{Mid pt} = \left(\frac{-1+5}{2}, \frac{2+4}{2}\right) = (3, 3)$$
$$m = \frac{4-2}{5-(-1)} = \frac{2}{6} = \frac{1}{3} \quad m_{\perp} = -3$$

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

$$y - 3 = -3x + 9$$

$$3x + y - 12 = 0$$

cuts y axis @ $x=0$

$$y = 12$$

(0, 12)

$$\Rightarrow H = 12$$



B Questions

Q1 (i) $(-1, -5)$ $3x - 4y - 2 = 0$

$$d = \frac{|3(-1) - 4(-5) - 2|}{\sqrt{3^2 + 4^2}} = \frac{|-3 + 20 - 2|}{\sqrt{9 + 16}} = \frac{15}{5} = 3$$

(ii) $(-1, -5)$ $3x - 4y + k = 0$

$$3 = \frac{|3(-1) - 4(-5) + k|}{\sqrt{25}}$$

$$3 = \frac{-3 + 20 + k}{5}$$

$$15 = 17 + k$$

$$k = -2$$

$$3 = \frac{-(-3 + 20 + k)}{5}$$

$$15 = -17 - k$$

$$k = -17 - 15$$

$$k = -32$$

Q2 (i) $(-7, 3)$ $(8, -2)$ $2:3$

$$\left(\frac{3(-7) + 2(8)}{3+2}, \frac{3(3) + 2(-2)}{3+2} \right)$$

$$\left(\frac{-21 + 16}{5}, \frac{9 - 4}{5} \right)$$

$$(-1; 1) \checkmark$$

Q2 (ii) $2x + ky = 6$

(a) cut $x \Rightarrow y=0$ $2x = 6$

$x = 3$

$(3, 0)$

cut $y \Rightarrow x=0$

$ky = 6$

$y = \frac{6}{k}$

$(0, \frac{6}{k})$

(b) $(0, 0)$ $(3, 0)$ $(0, \frac{6}{k})$

$A = \frac{1}{2} (3)(\frac{6}{k}) - (0)(0)$

$2k = \frac{18}{k}$

$2k^2 = 18$

$k^2 = 9$

$k = 3$

Q3

(i) $2x + y = 5$ $m = -2$ pt $(2, 5)$

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

$y - 5 = -2x + 4$

$2x + y - 9 = 0$

(ii) (a) $2x + y = 5$ $m = -2 \Rightarrow M_{\perp} = \frac{1}{2}$ $(1, k)$

$y - k = \frac{1}{2}(x - 1)$

$2y - 2k = x - 1$

$x - 2y - 1 + 2k = 0$

(b) contains $(0, 0)$ $-1 + 2k = 0$

$2k = 1$

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

Q4

centroid: $(4, 2)$ $(-1, 7)$ (h, k)

$$\left(\frac{4 - 1 + h}{3}, \frac{2 + 7 + k}{3} \right) = (2, 4)$$

$$\frac{3 + h}{3} = 2$$

$$\frac{9 + k}{3} = 4$$

$$3 + h = 6$$

$$9 + k = 12$$

$$h = 3$$

$$k = 3$$

Q5

(i) ~~eqn~~ $(1.5, 2)$ $(2.5, 0)$ $m = \frac{0 - 2}{2.5 - 1.5} = -\frac{2}{1}$

eqn: $y - 2 = -2(x - 1.5)$
 $y - 2 = -2x + 3$
 $2x + y = 5$

(ii) A is where cuts y axis $\Rightarrow x = 0$.

$$y = 5. \quad \text{ans} = 5 \text{ m.}$$

(iii) dis $(0, 5)$ to $(2.5, 0)$

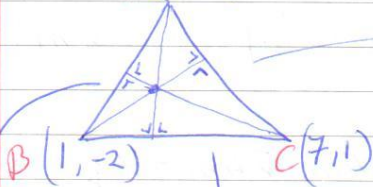
$$\begin{aligned} &= \sqrt{(2.5 - 0)^2 + (0 - 5)^2} \\ &= \sqrt{6.25 + 25} \\ &= \sqrt{31.25} \\ &= 5.59 \text{ m} = 559 \text{ cm.} \end{aligned}$$



Q6

orthocentre \Rightarrow \perp lines + vertex.

A (1, 8)



$$m = \frac{1-8}{7-1} = -\frac{7}{6} \quad m_{\perp} = \frac{6}{7} \text{ pt}(1, 8)$$

$$y+2 = \frac{6}{7}(x-1)$$

$$7y+14 = 6x-6$$

$$\boxed{6x-7y-20=0}$$

$$x=1$$

$$m = \frac{-2-8}{1-1} = \frac{-10}{0}$$

\Rightarrow line // to axis.

$$x=1$$

$$\Rightarrow \perp m = 0$$

$$y-1 = 0(x-7)$$

$$y-1 = 0$$

$$y=1$$

$$m = \frac{1+2}{7-1} = \frac{3}{6} = \frac{1}{2} \quad m_{\perp} = -2 \text{ pt}(1, 8)$$

$$y-8 = -2(x-1)$$

$$y-8 = -2x+2$$

$$\boxed{2x+y-10=0}$$

at $y=1$

$$6x-7-20=0$$

$$6x=27$$

$$x = \frac{27}{6}$$

$$x = 4\frac{1}{2}$$

$$\left(4\frac{1}{2}, 1\right)$$

$$\begin{array}{r} 6x-7y = 20 \\ 2x+y = 10 \quad (\times 7) \\ \hline 6x-7y = 20 \\ 14x+7y = 70 \\ \hline 20x = 90 \\ x = 4\frac{1}{2} \end{array}$$

$$\begin{array}{r} 2(4\frac{1}{2}) + y = 10 \\ y = 1 \end{array}$$

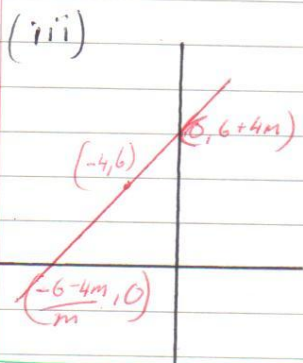
$$\left(4\frac{1}{2}, 1\right)$$

Q7 $(-4, 6)$ slope = m

(i) $y - 6 = m(x + 4)$
 $y - 6 = mx + 4m$
 $mx - y + 4m + 6 = 0$

(ii) cuts $x \Rightarrow y = 0$
 $mx + 4m + 6 = 0$
 $mx = -4m - 6$
 $x = \frac{-4m - 6}{m}$ $(\frac{-4m - 6}{m}, 0)$

cuts $y \Rightarrow x = 0$
 $-y + 4m + 6 = 0$
 $y = 4m + 6$ $(0, 4m + 6)$



Area = $\frac{1}{2}$ base \times height.
 $54 = \frac{1}{2} \left(\left| \frac{-6 - 4m}{m} \right| \right) (6 + 4m)$
 $108 = \left(\frac{6 + 4m}{m} \right) (6 + 4m)$
 $108m = (6 + 4m)^2$
 $108m = 36 + 48m + 16m^2$

OR $(0, 0)$ $(\frac{-6 - 4m}{m}, 0)$ $(0, 4m + 6)$
 $54 = \frac{1}{2} \left[\left(\frac{-6 - 4m}{m} \right) (4m + 6) + (0)(0) \right]$
 $16m^2 - 60m + 36 = 0$
 $4m^2 - 15m + 9 = 0$
 $(4m - 3)(m - 3) = 0$
 $m = \frac{3}{4}$ $m = 3$

$108 = \left| \frac{(-6 - 4m)(4m + 6)}{m} \right|$

$108m = |(-6 - 4m)(4m + 6)|$

$108m = \pm [-24m - 36 - 16m^2 - 24m]$

$108m = |-16m^2 - 48m - 36|$

$108m = \pm (-16m^2 - 48m - 36)$

$108m = 16m^2 + 48m + 36$

$16m^2 - 60m + 36 = 0$

Then as above.

Q8 (i) $(3, k)$ $3x - 4y + 7 = 0$ $d = 6$

$$\frac{|3(3) - 4(k) + 7|}{\sqrt{3^2 + (-4)^2}} = 6$$

$$\frac{|9 - 4k + 7|}{\sqrt{9 + 16}} = 6$$

$$|16 - 4k| = 30$$

$$16 - 4k = 30$$

$$-14 = 4k$$

$$-7/2 = k$$

$$\text{But } k = -3\frac{1}{2}$$

$$-16 + 4k = 30$$

$$4k = 46$$

$$k = 11\frac{1}{2}$$

But $k < 0 \Rightarrow$ Not this Sol

(ii) Eqn thro $(3, -7/2)$ and $\parallel 3x - 4y + 7 = 0 \Rightarrow m = 3/4$

$$y + 7/2 = 3/4(x - 3)$$

$$4y + 14 = 3x - 9$$

$$3x - 4y - 23 = 0$$

Q9 (2,5) slope = m

(i) $y - 5 = m(x - 2)$

$$y - 5 = mx - 2m$$

$$mx - y + 5 - 2m = 0$$

(ii) Cuts x $\Rightarrow y = 0$

$$mx + 5 - 2m = 0$$

$$mx = 2m - 5$$

$$x = \frac{2m - 5}{m}$$

$$\left(\frac{2m - 5}{m}, 0\right)$$

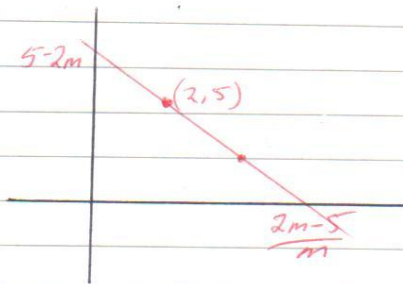
Cuts y $\Rightarrow x = 0$

$$-y + 5 - 2m = 0$$

$$y = 5 - 2m$$

$$(0, 5 - 2m)$$

(iii) Area = 36



$$36 = \frac{1}{2} \left(\frac{2m - 5}{m}\right)(5 - 2m)$$

$$72m = (2m - 5)(5 - 2m)$$

$$72m = 10m - 4m^2 - 25 + 10m$$

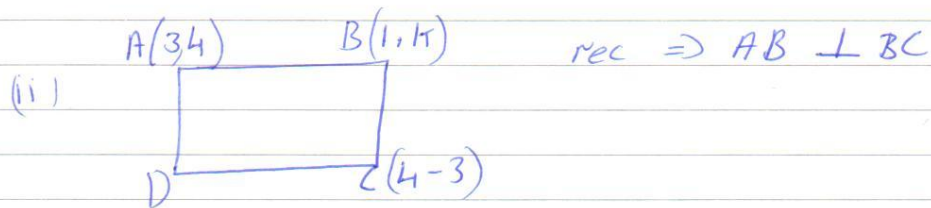
$$4m^2 + 52m + 25 = 0$$

$$(2m + 1)(2m + 25) = 0$$

$$m = -\frac{1}{2} \quad m = -\frac{25}{2}$$

Q10 A (3,4) B (1,k) C (4,-3)

$$(i) m_{AB} = \frac{k-4}{1-3} = \frac{k-4}{-2} \Rightarrow \frac{4-k}{2}$$



$$m_{BC} = \frac{-3-k}{4-1} = \frac{-3-k}{3}$$

$$\perp \Rightarrow \frac{k-4}{-2} = \frac{3}{3+k}$$

$$\begin{aligned}(k-4)(3+k) &= -6 \\ 3k + k^2 - 12 - 4k &= -6 \\ k^2 - k - 6 &= 0 \\ (k-3)(k+2) &= 0 \\ k &= 3 \quad k = -2\end{aligned}$$

(iii) Area

A	B	C
(3,4)	(1,3)	(4,-3)
(2,1)	(0,0)	(3,-6)

(Note: In the original image, there are arrows indicating a shift of 1 unit down from B to (1,0) and 3 units right from (1,0) to (4,0).)

$$A = \frac{1}{2} |(2)(-6) - (3)(1)|$$

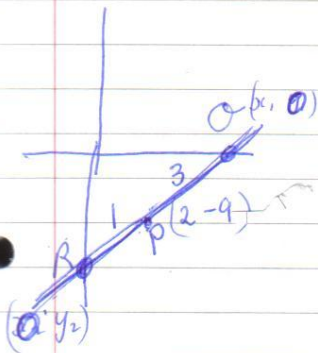
$$\frac{1}{2} |-12-3|$$

$$= \frac{1}{2} |15| \quad \times 2 \text{ for Rec.}$$

$$\Rightarrow \text{Area} = 15 \text{ sq Units}$$

C Questions

$$1. \left(\frac{bx_1 + ax_2}{b+a}, \frac{by_1 + ay_2}{b+a} \right) \quad a:b$$
$$3:1$$



$$(x, 0) \quad (0, y) \quad 3:1$$

$$\left(\frac{1(x) + 3(0)}{1+3}, \frac{1(0) + 3(y)}{1+3} \right) = (2, -9)$$

$$\frac{x}{4} = 2$$

$$x = 8$$

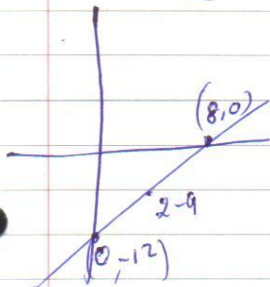
$$(8, 0)$$

$$\frac{3y}{4} = -9$$

$$3y = -36$$

$$y = -12$$

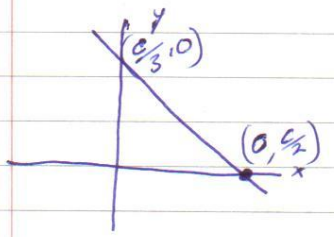
$$(0, -12)$$



~~Q~~

(ii) $3x + 2y = C \Rightarrow 3x + 2y - C = 0$
 cuts $x \Rightarrow y = 0$ $3x = C$ $x = \frac{C}{3}$

$m = \frac{3}{2}$ cuts $y \Rightarrow x = 0$ $2y = C$ $y = \frac{C}{2}$
 $(\frac{C}{3}, 0)$
 $(0, \frac{C}{2})$



$A = \frac{1}{2} B \times H$

$24 = \frac{1}{2} (\frac{C}{2}) (\frac{C}{3})$

$48 = \frac{C^2}{6}$
 $48 \times 6 = C^2$
 $288 = C^2$
 $\sqrt{288} = C$
 $12\sqrt{2} = C$

~~Q~~

Q7 eqn of 2 lines // to $4x - 3y + 8 = 0$ $LD = 4$ (0,0)

// \Rightarrow Same Slope $= \frac{-4}{-3} = \frac{4}{3}$

$4x - 3y + k = 0$ $(0,0), 4$

$4 = \frac{|4(0) - 3(0) + k|}{\sqrt{4^2 + 3^2}}$

$4 = \frac{|k|}{5}$

$\pm 20 = k$

\Rightarrow 2 lines are

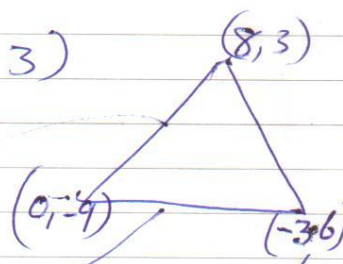
$4x - 3y + 20 = 0$

$4x - 3y - 20 = 0$



Q3 (0, -9) (-3, 6) (8, 3)

(1) circumcentre \Rightarrow \perp bisectors.



(1) mid pt = $\left(\frac{-3}{2}, \frac{-3}{2}\right)$

$m = \frac{6+9}{-3-0} = \frac{15}{-3} = -5$
 $m_{\perp} = \frac{1}{5}$

eqn: $y + 3/2 = \frac{1}{5}(x + 3/2)$

$5(y + 3/2) = (x + 3/2)$

$5y + \frac{15}{2} = x + \frac{3}{2}$ (x2)

$10y + 15 = 2x + 3$
 $2x - 10y - 12 = 0$

(2) mid pt = (4, -3) $m = \frac{-4-3}{0-8} = \frac{-7}{-8} = \frac{7}{8}$
 $m_{\perp} = -\frac{2}{3}$

eqn: $y + 3 = -\frac{2}{3}(x - 4)$
 $3y + 9 = -2x + 8$

$2x + 3y + 1 = 0$

$2x - 10y - 12 = 0$

$2x + 3y + 1 = 0$

$13y + 13 = 0$

$13y = -13$

$y = -1$

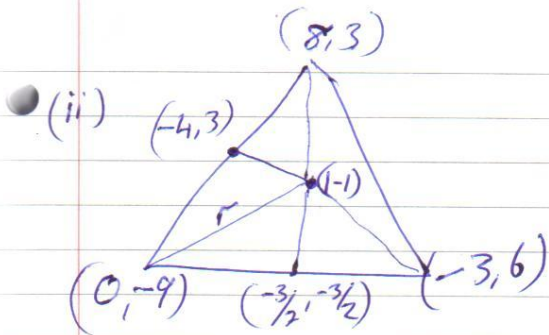
(1, -1)

$2x + 3(-1) + 1 = 0$

$2x - 3 + 1 = 0$

$2x = 2$

$x = 1$



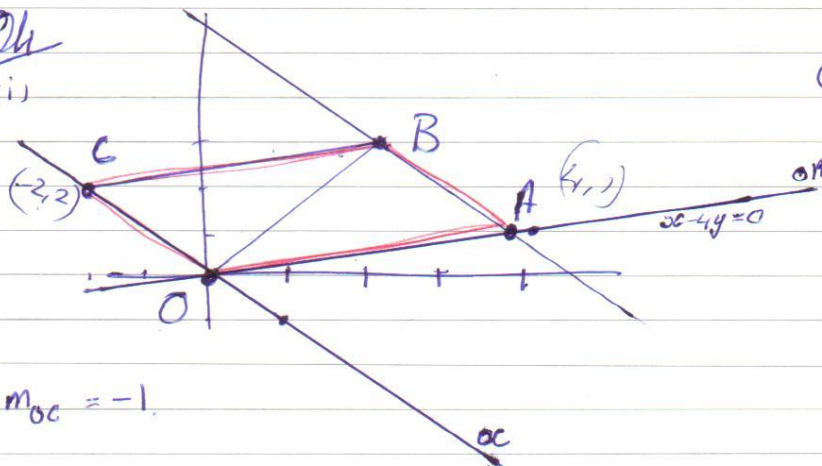
radius = from circumcentre to a vertex

dis $(1, -1) \rightarrow (0, -9)$

$$= \sqrt{(0-1)^2 + (-9+1)^2} = \sqrt{1+64} = \sqrt{65}$$

(iii) Area of Cir = πr^2
 $= \pi (\sqrt{65})^2$
 $= 65\pi$

Q4
 (i)



OA | $x=4y$
 $x-4y=0$
 cut $x \Rightarrow y=0$
 $\Rightarrow x=0$
 $(0,0)$

~~cut $y \Rightarrow x=0$~~
 $x=4$
 $4-4y=0$
 $-4y=-4$
 $y=1$
 $(4,1)$

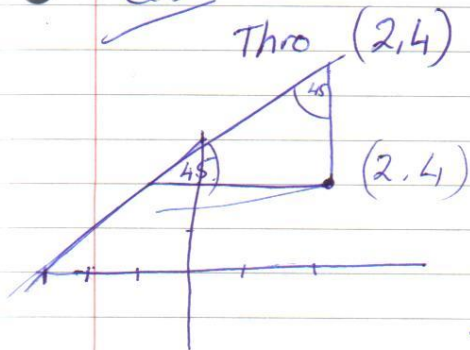
(ii) From Diagram,

$m_{BC} = -1$

Eqn of BC pt $(2,3)$ $m = //$ to OA $\Rightarrow x-4y=0$
 $y-3 = \frac{1}{4}(x-2)$
 $4y-12 = x-2$. $\boxed{x-4y+10=0}$ $m = \frac{-1}{-4} = \frac{1}{4}$

~~Q5~~

Q5



Thro (2, 4)

45° with $x - 2y - 6 = 0$.

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

$$\begin{pmatrix} 6, 0 \\ 0, -3 \end{pmatrix}$$

$$\tan \theta = \pm \left(\frac{m_1 - m_2}{1 + m_1 m_2} \right)$$

$$\tan 45 = \frac{\frac{1}{2} - m_2}{1 + \frac{1}{2} m_2} \times 2$$

$$1 = \pm \left(\frac{1 - 2m_2}{2 + m_2} \right)$$

↙ $2 + m_2 = \pm (1 - 2m_2)$ ↘

$$\begin{aligned} 2 + m_2 &= 1 - 2m_2 \\ 3m_2 &= -1 \\ m_2 &= -\frac{1}{3} \end{aligned}$$

$$\begin{aligned} 2 + m_2 &= -1 + 2m_2 \\ 3 &= m_2 \end{aligned}$$

Thro (2, 4) $m = -\frac{1}{3}$

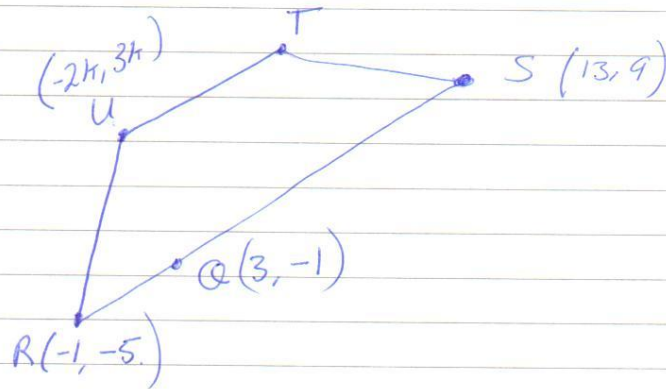
$$\begin{aligned} y - 4 &= -\frac{1}{3}(x - 2) \\ 3y - 12 &= -x + 2 \\ \checkmark x + 3y - 14 &= 0 \end{aligned}$$

Thro (2, 4) $m = 3$

$$\begin{aligned} y - 4 &= 3(x - 2) \\ y - 4 &= 3x - 6 \\ 3x - y - 2 &= 0 \end{aligned}$$



Q6



(i)

Area = 28 $R(-1, -5)$ $Q(3, -1)$ $U(-2k, 3k)$
 $\begin{matrix} \cdot & \cdot & \cdot \\ \downarrow & \downarrow & \downarrow \\ (0, 0) & (4, 4) & (-2k+1, 3k+5) \end{matrix}$

$$28 = \frac{1}{2} |(4)(3k+5) - (-2k+1)(4)|$$

$$56 = |12k + 20 + 8k - 4|$$

$$56 = |20k + 16|$$

$$40 = 20k$$

$$2 = k \quad \text{positive Value.} \quad \Rightarrow U(-4, 6)$$

(ii) $M_{TS} = -\frac{3}{11}$ $T(x, y)$ $S(13, 9)$

$$M_{TS} = \frac{9-y}{13-x} = -\frac{3}{11}$$

$M_{TU} \parallel M_{SR}$ $M_{SR} = \frac{9+5}{13+1} = \frac{14}{14} = 1$

$M_{TU} = 1$ $T(x, y)$ $U(-4, 6)$ $M = \frac{6-y}{-4-x} = 1$

$$11(9-y) = -3(13-x)$$

$$99 - 11y = -39 + 3x$$

$$\boxed{3x + 11y - 138 = 0}$$

$$6-y = -4-2x$$

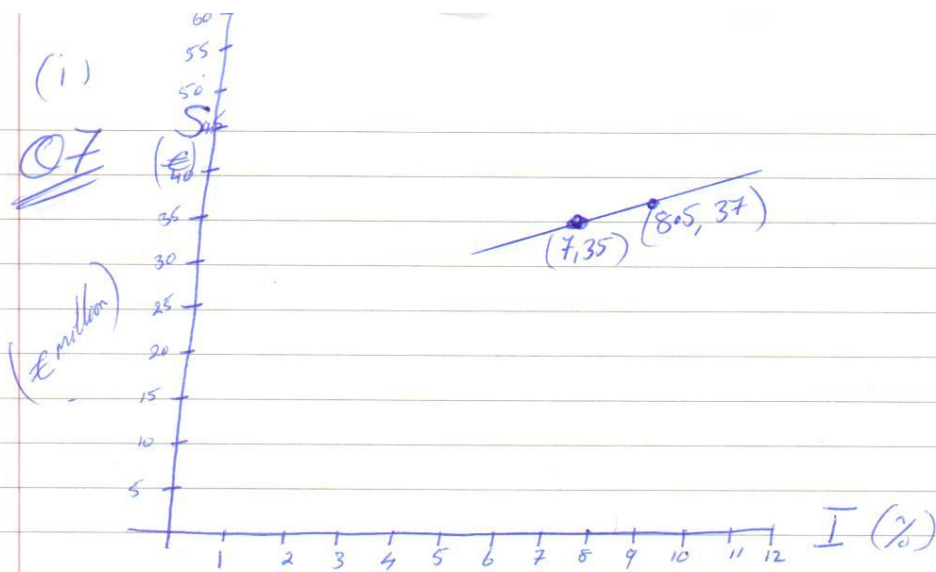
$$\boxed{2x - y + 10 = 0} \times 3$$

$$\begin{array}{r} 3x + 11y - 138 = 0 \\ -3x + 3y + 30 = 0 \\ \hline 14y = 168 \\ y = 12 \end{array}$$

$$2x - 12 + 10 = 0$$

$$2x = 2$$

$$T(2, 12)$$



(ii) $m = \frac{37 - 35}{8.5 - 7} = \frac{2}{1.5} = \frac{4}{3}$

$$y - 35 = \frac{4}{3}(x - 7)$$

$$3y - 105 = 4x - 28$$

$$4x - 3y + 77 = 0$$

(iii) $11.5\% \Rightarrow x$

$$4(11.5) - 3y + 77 = 0$$

$$46 - 3y + 77 = 0$$

$$123 = 3y$$

$$41 \text{ million} = y$$

(iv) $40 \text{ million} \Rightarrow y$

$$4x - 3(40) + 77 = 0$$

$$4x - 120 + 77 = 0$$

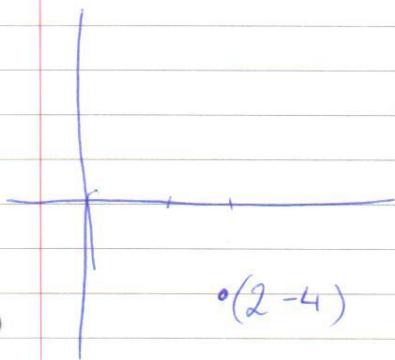
$$4x = 43$$

$$x = 10\frac{3}{4}\%$$

Q8

$$(2, -4)$$

$$(x, 0) \quad (0, y_1)$$



$$y + 4 = m(x - 2)$$
$$y + 4 = mx - 2m$$

Eqn of line $mx - y - 2m - 4 = 0$.

$$x + y = -4$$

cuts $x \Rightarrow y = 0$

$$mx - 2m - 4 = 0$$
$$mx = 2m + 4$$
$$x_1 = \frac{2m + 4}{m}$$

cuts $y \Rightarrow x = 0$

$$-y - 2m - 4 = 0$$
$$-y = 2m + 4$$
$$y_1 = -2m - 4$$

$$x + y = -4 \Rightarrow \frac{2m + 4}{m} + (-2m - 4) = -4 \quad (xm)$$

$$2m + 4 - 2m^2 - 4m = -4m$$

$$2m^2 - 2m - 4 = 0$$

$$m^2 - m - 2 = 0$$

$$(m - 2)(m + 1) = 0$$

$$m = 2 \quad m = -1$$

$$\tan \theta = \frac{2 + 1}{1 + 2(-1)} = \frac{3}{1 - 2} = \frac{3}{-1} = -3$$

acute \Rightarrow Positive

$$\Rightarrow \tan \theta = 3$$

Q9 (i) $(2, -1)$

$$\begin{aligned}4x + 3y - 5 &= 0 \\4(2) + 3(-1) - 5 &= 0 \\8 - 3 - 5 &= 0 \\8 - 8 &= 0\end{aligned}$$

$0 = 0 \therefore b$ on line.

(ii) \parallel line $\Rightarrow 4x + 3y + k = 0$

eqn 2 lines \parallel r 2 write. $m = \frac{-4}{3}$

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

$$10 = |8 - 3 + k|$$

$$10 = \pm(5 + k)$$

$$5 + k = 10$$

$$k = 5$$

$$5 + k = -10$$

$$k = -15$$

Eqns: $4x + 3y + 5 = 0$ r $4x + 3y - 15 = 0$.

Q10 (i) $tx + (t+2)y - 11 = 0$

$$m = \frac{-t}{t+2}$$

ii) $x - 2y - 1 = 0 \Rightarrow tx + (t+2)y - 11 = 0$

$$m = \frac{-1}{-2} = \frac{1}{2}$$

$$m = \frac{-t}{t+2}$$

$$\tan 45^\circ = \frac{\frac{1}{2} - \left(\frac{-t}{t+2}\right)}{1 + \frac{1}{2}\left(\frac{-t}{t+2}\right)} \times \frac{2}{2} \frac{t+2}{t+2}$$

$$1 = \frac{1 + \frac{2t}{t+2}}{2 - \frac{t}{t+2}} \cdot \frac{t+2}{t+2}$$

$$1 = \frac{t+2 + 2t}{2t+4 - t}$$

$$1 = \frac{3t+2}{t+4}$$

$$t+4 = \pm(3t+2)$$

$$t+4 = 3t+2$$

$$2 = 2t$$

~~$$t = 1$$~~

$$1 = t$$

$$t+4 = -3t-2$$

$$4t = -6$$

$$t = \frac{-6}{4} = -\frac{3}{2}$$