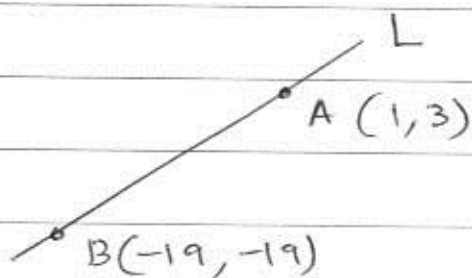


6



$$m_L = \frac{-19 - 3}{-19 - 1} = \frac{22}{20} = \frac{11}{10}$$

$$y - y_1 = m(x - x_1)$$

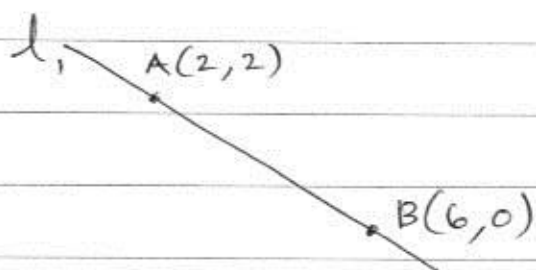
$$y - 3 = \frac{11}{10}(x - 1)$$

$$10y - 30 = 11x - 11$$

$$\underline{\underline{11x - 10y + 19 = 0}}$$

7

(a)



$$m_{AB} = \frac{2 - 0}{2 - 6} = \frac{2}{-4} = -\frac{1}{2}$$

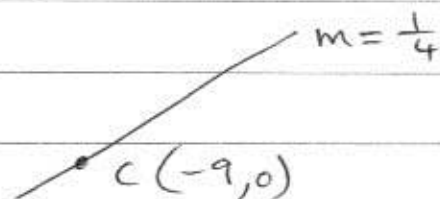
$$y - y_1 = m(x - x_1)$$

$$y - 0 = -\frac{1}{2}(x - 6)$$

$$2y = -x + 6$$

$$\underline{\underline{x + 2y - 6 = 0}}$$

(b)



$$y - y_1 = m(x - x_1)$$

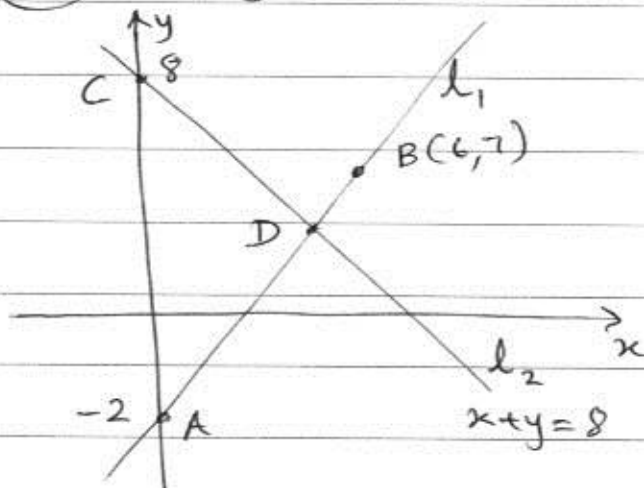
$$y - 0 = \frac{1}{4}(x - (-9))$$

$$4y = x + 9$$

$$\underline{\underline{x - 4y + 9 = 0}}$$

8

$$x + y = 8 \Rightarrow y = -x + 8$$



$$(a) m_{AB} = \frac{7 - 0}{6 - (-2)} = \frac{7}{8}$$

y-intercept of  $l_1 = -2$

∴ Equation of  $l_1$ :

$$y = \frac{7}{8}x - 2$$

(b) Point D:

$$\left. \begin{array}{l} x + y = 8 \\ y = \frac{7}{8}x - 2 \end{array} \right\} \begin{array}{l} \text{Solve} \\ \text{simultaneously} \\ \text{simultaneously} \end{array}$$

$$x + \frac{7}{8}x - 2 = 8$$

$$2x + 7x - 4 = 16$$

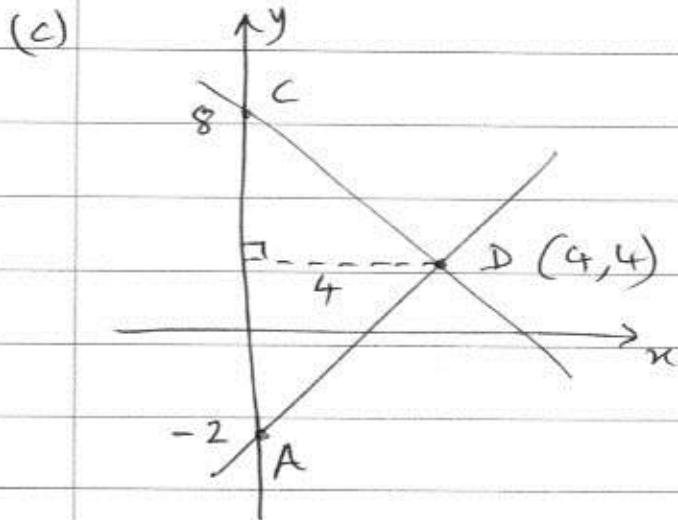
$$5x = 20$$

$$x = 4$$

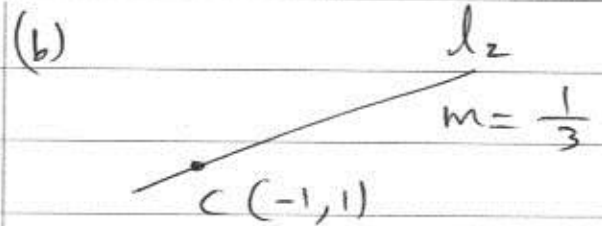
sub  $x = 4$ ,

$$y = \frac{7}{8} \times 4 - 2 = 4$$

$$\therefore D \rightarrow (4, 4)$$



Length  $AC = 10$   
 $\therefore$  Area of  $\triangle ACD$   
 $= \frac{1}{2}bh$   
 $= \frac{1}{2} \times 10 \times 4$   
 $= \underline{\underline{20 \text{ unit}^2}}$

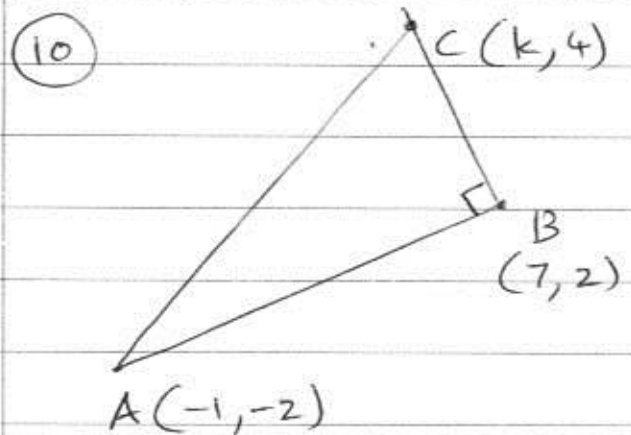


$$y - y_1 = m(x - x_1)$$

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

$$3y - 3 = x + 1$$

$$\underline{\underline{x - 3y + 4 = 0}}$$



(a)  $m_{AB} = \frac{2 - (-2)}{7 - (-1)} = \underline{\underline{\frac{1}{2}}}$

(b) Since  $BC$  is perpendicular to  $AB$ ,  
 $m_{BC} = -2$

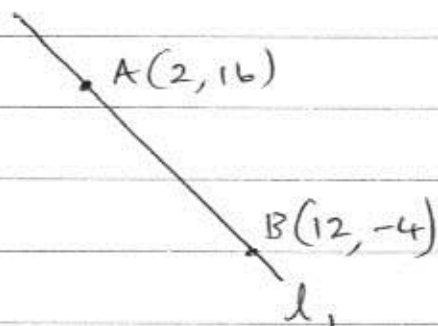
$$\therefore \frac{4 - 2}{k - 7} = -2$$

$$2 = -2k + 14$$

$$2k = 12$$

$$\therefore \underline{\underline{k = 6}}$$

(9)  
 (a)



$$m_{AB} = \frac{16 - (-4)}{2 - 12} = -2$$

$$y - y_1 = m(x - x_1)$$

$$y - (-4) = -2(x - 12)$$

$$y + 4 = -2x + 24$$

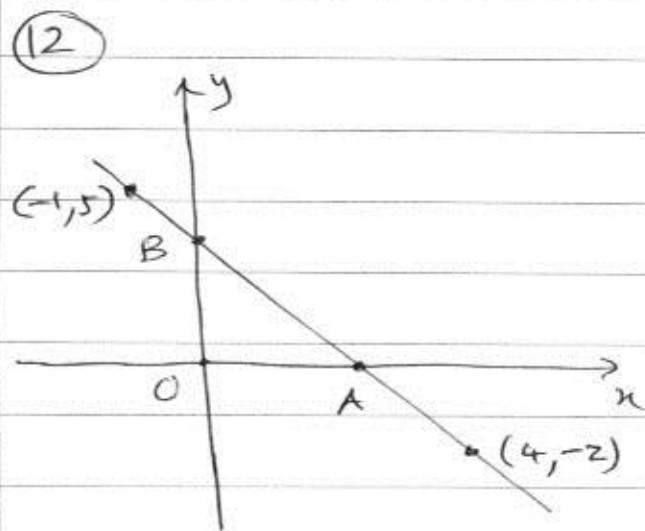
$$\underline{\underline{2x + y = 20}}$$

(c)  $m_{BC} = -2$ ,  $B(7, 2)$   
 Equation of line BC:  
 $y - y_1 = m(x - x_1)$   
 $y - 2 = -2(x - 7)$   
 $y - 2 = -2x + 14$   
 $2x + y - 16 = 0$

(c)  $y = \sqrt{3}x + 2\sqrt{3}$   
 sub  $y = 0$   
 $0 = \sqrt{3}x + 2\sqrt{3}$   
 $-2\sqrt{3} = \sqrt{3}x$   
 $x = -2$   
 $\therefore C \rightarrow \underline{\underline{(-2, 0)}}$

(11)  
 $m_{AB} = \frac{3 + 4\sqrt{3} - 3\sqrt{3}}{2 + \sqrt{3} - 1}$   
 $= \frac{3 + \sqrt{3}}{1 + \sqrt{3}}$   
 $= \frac{(3 + \sqrt{3})(1 - \sqrt{3})}{(1 + \sqrt{3})(1 - \sqrt{3})}$   
 $= \frac{3 - 3\sqrt{3} + \sqrt{3} - 3}{1 - 3}$   
 $= \frac{-2\sqrt{3}}{-2}$   
 $= \underline{\underline{\sqrt{3}}}$

(b)  $m = \sqrt{3}$ ,  $A(1, 3\sqrt{3})$   
 Equation of  $l$ :  
 $y - y_1 = m(x - x_1)$   
 $y - 3\sqrt{3} = \sqrt{3}(x - 1)$   
 $y - 3\sqrt{3} = \sqrt{3}x - \sqrt{3}$   
 $y = \sqrt{3}x - \sqrt{3} + 3\sqrt{3}$   
 $y = \underline{\underline{\sqrt{3}x + 2\sqrt{3}}}$



(a)  $m_{AB} = \frac{5 - -2}{-1 - 4}$   
 $= -\frac{7}{5}$   
 $y - y_1 = m(x - x_1)$   
 $y - 5 = -\frac{7}{5}(x - -1)$

$5y - 25 = -7x - 7$   
 $7x + 5y - 18 = 0$

(b)  $7x + 5y - 18 = 0$   
 sub  $y = 0$ ,  
 $7x - 18 = 0$

$$x = \frac{18}{7}$$

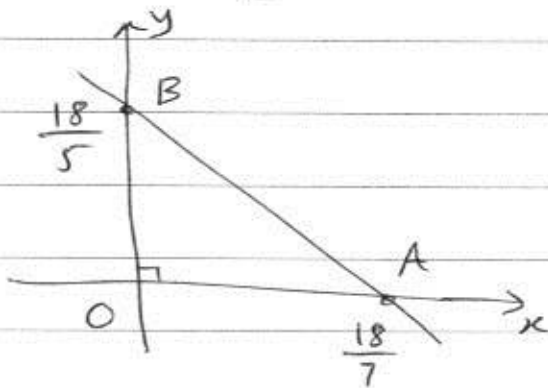
$$\therefore A \rightarrow \left(\frac{18}{7}, 0\right)$$

sub  $x=0$

$$5y - 18 = 0$$

$$y = \frac{18}{5}$$

$$\therefore B \rightarrow \left(0, \frac{18}{5}\right)$$

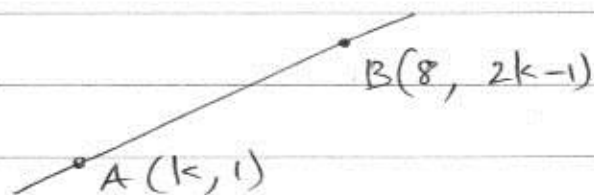


Area of  $\triangle OAB$

$$= \frac{1}{2} \times \frac{18}{7} \times \frac{18}{5}$$

$$= \frac{162}{35} \text{ unit}^2$$

(13)



$$(a) \quad \frac{2k-1-1}{8-k} = \frac{1}{3}$$

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

$$3(2k-2) = 8-k$$

$$6k - 6 = 8 - k$$

$$7k = 14$$

$$\underline{\underline{k=2}}$$

(b) Since  $k=2$ ,  
 $A \rightarrow (2, 1)$

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

$$y - y_1 = m(x - x_1)$$

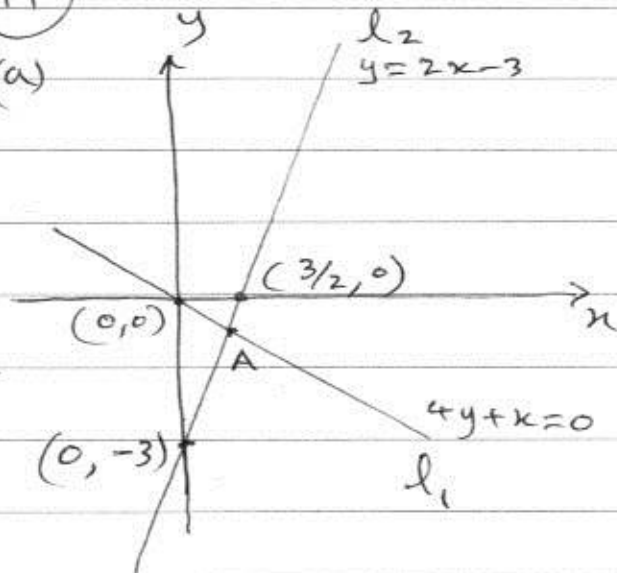
$$y - 1 = \frac{1}{3}(x - 2)$$

$$3y - 3 = x - 2$$

$$\underline{\underline{x - 3y + 1 = 0}}$$

(14)

(a)



$$4y + x = 0 \Rightarrow y = -\frac{1}{4}x$$

$$y = 2x - 3$$

sub  $y=0$

$$2x - 3 = 0$$

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

$$(b) \quad y = -\frac{1}{4}x$$

$$y = 2x - 3$$

Solving simultaneously,

$$2x - 3 = -\frac{1}{4}x$$

( $\times 4$ )

$$8x - 12 = -x$$

$$9x = 12$$

$$x = \frac{12}{9} = \frac{4}{3}$$

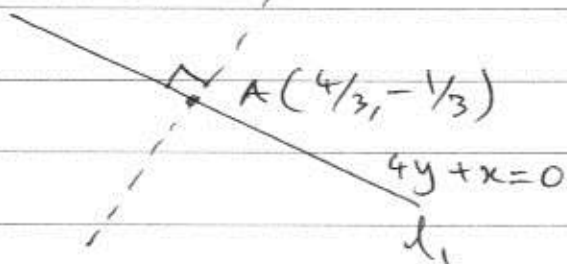
$$\text{sub } x = \frac{4}{3}$$

$$y = -\frac{1}{4} \times \frac{4}{3}$$

$$y = -\frac{1}{3}$$

$$\therefore A \rightarrow \left(\frac{4}{3}, -\frac{1}{3}\right)$$

(c)



$$4y + x = 0$$

$$y = -\frac{1}{4}x$$

$\therefore$  Grad. of perpendicular

$$\text{line} = 4$$

$$m = 4, \quad \left(\frac{4}{3}, -\frac{1}{3}\right)$$

$$y - y_1 = m(x - x_1)$$

$$y - \frac{1}{3} = 4\left(x - \frac{4}{3}\right)$$

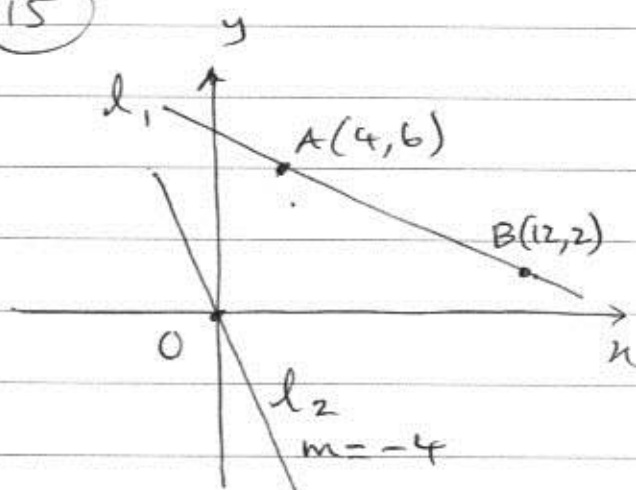
$$y + \frac{1}{3} = 4x - \frac{16}{3}$$

( $\times 3$ )

$$3y + 1 = 12x - 16$$

$$12x - 3y - 17 = 0$$

(15)



$$(a) \quad m_{AB} = \frac{6-2}{4-12} = \frac{4}{-8} = -\frac{1}{2}$$

$$y - y_1 = m(x - x_1)$$

$$y - 6 = -\frac{1}{2}(x - 4)$$

$$2y - 12 = -x + 4$$

$$x + 2y - 16 = 0$$

(b) Equation of  $l_2$ :

$$y = -4x$$

==

(c) Coordinates of C:

$$y = -4x$$

$$x + 2y - 16 = 0$$

Solving simultaneously,

$$x + 2(-4x) - 16 = 0$$

$$-7x - 16 = 0$$

$$x = -\frac{16}{7}$$

Sub  $x = -\frac{16}{7}$

$$y = -4\left(-\frac{16}{7}\right)$$

$$y = \frac{64}{7}$$

$\therefore C \rightarrow \left(-\frac{16}{7}, \frac{64}{7}\right)$

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