Sample Paper 2014: Paper 2

Question 3 (25 marks)

Question 3 (a)

To see if a point is on a line, substitute the point into the equation of the line and show it satisfies the equation.

Is $P(4k-2,\ 3k+1) \in l_1 : 3x-4y+10=0$?

$3(4k-2)-4(3k+1)+10$

$=12k-6-12k-4+10$

$=0$

Finding the slope from the equation of a line:

$l : ax+by+c=0$

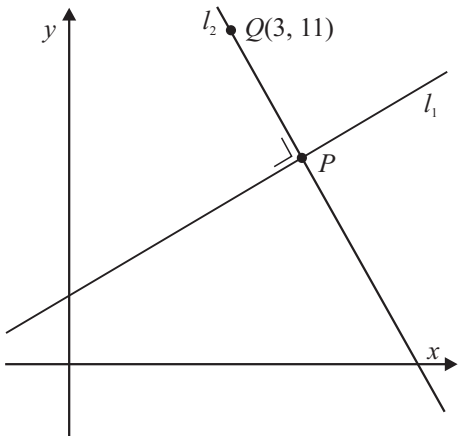
$m=-\dfrac{a}{b} \Rightarrow m_{\perp}=\dfrac{b}{a}$

Question 3 (b)

$l_1 : 3x-4y+10=0 \Rightarrow m_1=\frac{3}{4}$

$l_2 : m_2=-\frac{4}{3}$

Equation of l_2: Point $P(4k-2,\ 3k+1)$, $m_2=-\frac{4}{3}$



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

$3(y-3k-1)=-4(x-4k+2)$

$3y-9k-3=-4x+16k-8$

$4x+3y-25k+5=0$

Question 3 (c)

$Q(3,\ 11) \in l_2 : 4x+3y-25k+5=0$

$\therefore 4(3)+3(11)-25k+5=0$

$12+33-25k+5=0$

$50=25k$

$\therefore k=2$

Question 3 (d)

P is the point at the foot of the perpendicular.

$P(4k-2,\ 3k+1)=P(4(2)-2,\ 3(2)+1)=P(6,\ 7)$