

LINE (Q 3, PAPER 2)

2011

- 3. (a)** P and Q are the points $(-1, 4)$ and $(3, 7)$ respectively.
Find the co-ordinates of the point that divides $[PQ]$ internally in the ratio 3:1.
- (b)** f is the transformation $(x, y) \rightarrow (x', y')$, where $x' = x - y$ and $y' = 2x + 3y$.
 l_1 is the line $2x - y - 1 = 0$.
- (i)** Find the equation of $f(l_1)$, the image of l_1 under f .
- (ii)** Prove that f maps every pair of parallel lines to a pair of parallel lines.
You may assume that f maps every line to a line.
- (iii)** The line l_2 is parallel to the line l_1 .
 $f(l_2)$ intersects the x -axis at A' and the y -axis at B' .
The area of the triangle $A'OB'$ is 9 square units, where O is the origin.
Find the two possible equations of l_2 .
- (iv)** Given that $A' = f(A)$ and $B' = f(B)$, show that $|\angle AOB| \neq |\angle A'OB'|$.

ANSWERS

3 (a) $(2, \frac{25}{4})$

(b) (i) $8x' + y' - 5 = 0$

(iii) $8x' + y' + 12 = 0, 8x' + y' - 12 = 0$