$=-40 \Longrightarrow b(-10, 0) \in L$

THE LINE (Q 2, PAPER 2)

2002 2 (a) Find the co-ordinates of the point of intersection of the line 4x + y = 5and 3x - 2y = 12. (b) The line *L* has equation 4x - 5y = -40. a(0, 8) and b(-10, 0) are two points. (i) Verify that *a* and *b* lie on *L*. (ii) What is the slope of *L*? (iii) The line K is perpendicular to L and it contains b. Find the equation of K. (iv) *K* intersects the *y*-axis at the point *c*. Find the co-ordinates of *c*. (v) d is another point such that *abcd* is a rectangle. Calculate the area of *abcd*. (vi) Find the co-ordinates of d. **SOLUTION** 2 (a) **INTERSECTING LINES** To find out where two lines intersect, solve their equations simultaneously. $4x + y = 5....(1)(\times 2)$ 8x + 2y = 103x - 2y = 12...(2)3x - 2y = 1211x $= 22 \Longrightarrow x = 2$ Substitute this value of *x* into Eqn. (1). $\therefore 4(2) + y = 5 \Longrightarrow 8 + y = 5$ $\therefore y = -3$ Point of intersection: (2, -3)2 (b) (i) IS A POINT ON A LINE? To show a point is on a line, put the point into the equation. $a(0, 8) \in L?$ 4x - 5y = 4(0) - 5(8)= 0 - 40 $=-40 \Longrightarrow a(0, 8) \in L$ $b(-10, 0) \in L?$ 4x - 5y = 4(-10) - 5(0)= -40 + 0



