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A LEVEL MATHS

(27) Straight Line Graphs (Parallel & Perpendicular)

WORKING AT D/E

(1) Write down gradient of the line (a) parallel and (b) perpendicular to the line with equation $y = 3x$

(2) Show that the lines $5x + 2y = 8$ and $y - x = 4$

Are neither parallel nor perpendicular.

(3) Find the equation of the line perpendicular to the line with equation $y = \frac{2}{5}x - 8$ that passes through the point $(2,3)$. Give your answer in the form $y = mx + c$

WORKING AT B/C

(1) Given that the line with equation $y = 4x + 7$ is perpendicular to the line with equation $ax - 2y + 8 = 0$, show that $a = \frac{-1}{2}$

(2) $A\ (-1,5)$ and $B\ (5,1)$ create the line segment AB. Show, using algebra, that the perpendicular bisector of AB can be written in the form $y = mx$ where m is a constant to be found.

(3) The line $y = px + c$ is parallel to a line passing through the points $(a, 0)$ and $(0, b)$. Write an expression for p in terms of a and b.

WORKING AT A*/A

(1) The perpendicular bisector of the line $x + y = a$ where a is a positive constant has equation $py = qx + r$ where p, q and r are also constants.

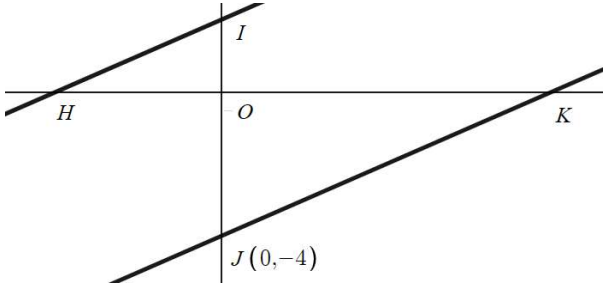
Show, with full workings, that $p = q$ and that $r = 0$

(2) Lines L_1 and L_2 are two different lines.

The equation of L_1 is $y = mx + c$
The equation of L_2 is $x + py + q = 0$
Where m, p and q are non-zero constants.

Find the set of values for p in terms of m for which the lines intersect.

(3) The diagram below shows two parallel lines. The points $H, I, J\ (0,4)$ and K lie on one of the two lines.



Given O is the origin, $OJ = 2OI$ and $OH = 2.5OI$, find the equation of the line passing through the points I and K in the form $y = mx + c$