Cambridge International AS & A Level

Mathematics

9709

Paper 1 Pure Mathematics 1

Topic 3-Coordinate Geometry

Question No (20)

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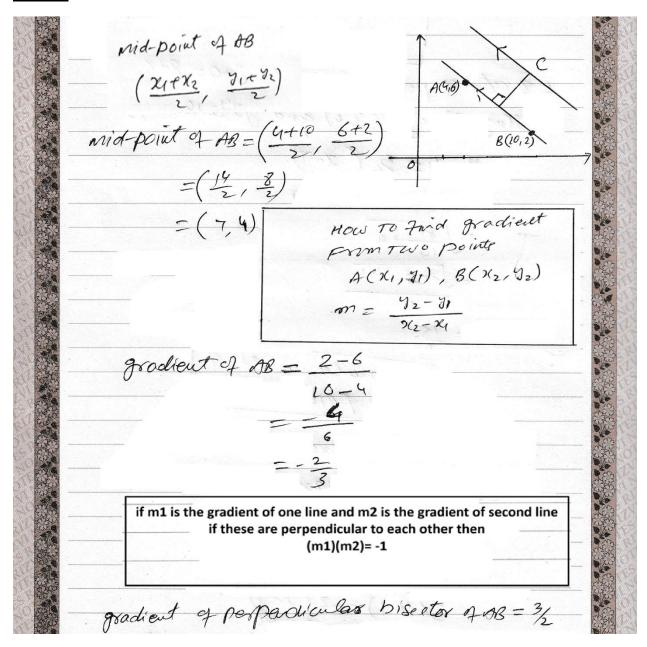
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Question No (20)

The point C lies on the perpendicular bisector of the line joining the points A (4, 6) and B (10, 2). C also lies on the line parallel to AB through (3, 11).

- (i) Find the equation of the perpendicular bisector of AB.
- (ii) Calculate the coordinates of C.

Solution



Equation of line from one

point $\rho(x_1, y_1)$ and grackent m

is $j-y_1 = m(x-x_1)$

Equation of perpendicular bisector ABBpassing through (7,4) and gradient $\frac{3}{2}$ $y-4=\frac{3}{2}(x-7)$ 2(y-4)=3(x-7) 2y-8=3x-24 2y=3x-21+8 $2y=3x-13 \rightarrow 0$

if m1 is the gradient of one line and m2 is the gradient to second line, if these lines are parallel then m1=m2

Grodient of line parallel to AB = $-\frac{7}{3}$ Equation of line parallel to AB and

passing through (3,11) is $y-11=-\frac{2}{3}(\pi-3)$ $3(y-11)=-2(\pi-3)$ $3(y-11)=-2(\pi-3)$ $3y-33=-2\pi+6$ $2\pi+3y=39$ 2x+3y=39

	From D	
	29 = 3x - 13	
	y = 3x - 13	
	$J = \frac{3x-13}{2}$ put This value, $y = \frac{3x-13}{2}$ in	3
2	$+3(\frac{32-13}{3})=39$	
	(x) + 3(3x - 13) = 2(39)	
7	x + 9x - 39 = 78	
	132 = 78+39	
	$13 \times = 117$	
	$\chi = \frac{117}{13}$ $\chi = 9$ $1 - 3\chi - 13$	
	$\chi = 9$ $put x = 9 \text{ in } J = \frac{3x-13}{2}$	
	y = 3(9) - 13	
	= 27 - 13	
	2	
	y=7	
• . (coordinates of c are (9,7).	
	- J,	