HIGHER

8.10 Vectors Proof Questions: 10-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

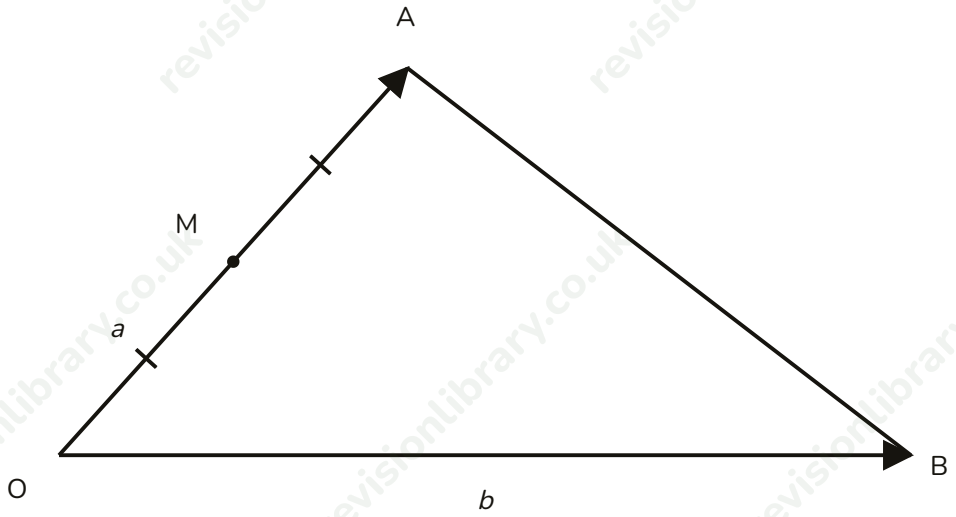
1 OA = <1, 2>, OB = <4, 5>. Point P has position vector OP = (2/3)OA + (1/3)OB.
Show that P lies on the line AB and find the ratio AP:PB.

(Total for Question 1 is 3 marks)

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2 Triangle OAB has OA = a and OB = b. M is the midpoint of OA.

Diagram NOT accurately drawn



(a) Find the vector OM in terms of a. **(1)**

.....

(b) Find the vector MA in terms of a. **(1)**

.....

(c) Find the vector MB in terms of a and b. **(2)**

.....

(Total for Question 2 is 4 marks)

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3 OAB is a triangle. OA = a and OB = b. P is the point on OA such that OP:PA = 1:1. Q is the point on OB such that OQ:QB = 1:1. Find PQ in terms of a and b.

(Total for Question 3 is 2 marks)

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Mark scheme · 8.10 Vectors Proof Questions: 10-minute Pack

Question 1

calculate OP = (2/3)<1,2> + (1/3)<4,5> = <2,3> oe	**M1**
write OP = OA + t(OB - OA) and solve 1 + 3t = 2, 2 + 3t = 3 to get t = 1/3 oe	**M1**
AP:PB = 1:2 cao	**A1**

Answer: P lies on AB with AP:PB = 1:2. (OP = <2,3>, t = 1/3 so AP = 1/3 AB.)

Question 2

(a) (1/2)a (oe) (cao)	**B1**

(a) Answer: OM = (1/2)a

(b) (1/2)a (oe) (cao)	**B1**

(b) Answer: MA = (1/2)a

(c) correct method, e.g. MB = OB - OM (oe MB = MA + AB)	**M1**
(c) b - (1/2)a (oe) (cao)	**A1**

(c) Answer: MB = b - (1/2)a

Question 3

PQ = PO + OQ or OQ - OP	**M1**
-(1/2)a + (1/2)b oe	**A1**

Answer: PQ = -(1/2)a + (1/2)b

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