

MATHEMATICS EXAM

TIME: 2 HOURS

INSTRUCTIONS:

ANSWER ALL QUESTIONS

QUESTION 1 (20 MARKS)

Given the points $A(3, 4)$ and $B(9, 2)$, find the coordinates of T , if

$$OT = OA + \frac{1}{2}AB.$$

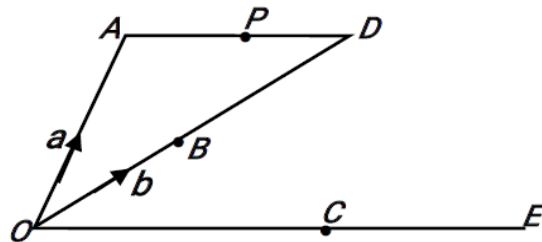
Given that $a = \begin{pmatrix} -2 \\ -9 \end{pmatrix}$, $b = \begin{pmatrix} 7 \\ 2 \end{pmatrix}$ and $m = a + 2b$, find the magnitude

Given the vectors $a = \begin{pmatrix} -2 \\ 7 \end{pmatrix}$, $b = \begin{pmatrix} 8 \\ 11 \end{pmatrix}$ and $c = \begin{pmatrix} 4 \\ -5 \end{pmatrix}$, find the length of

$$a + 2b + c.$$

QUESTION 2 (30 MARKS)

In the figure below, P is a point on AD such that $PD : AP = 1 : 2$, $OA = a$, $OB = b$, $3OB = 2BD$ and $OC = 3CE = 3AP$.



(a) Express the following vectors in terms of a and b :

(i) AD

(ii) BP

(iii) DC

END