

GCSE VECTORS

*20

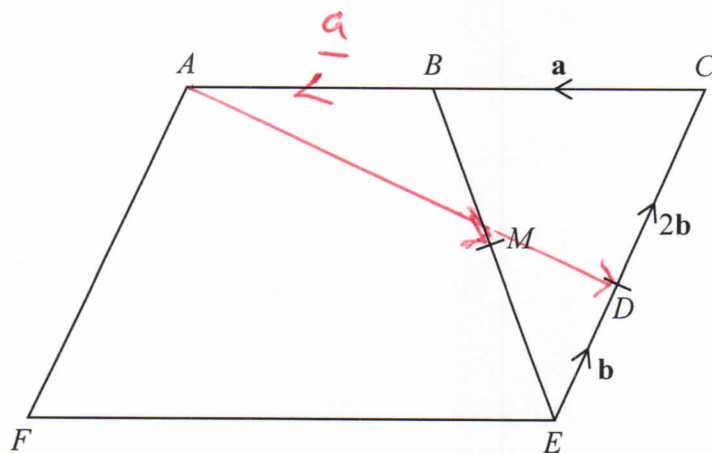


Diagram **NOT** accurately drawn

$$\begin{aligned} \vec{AD} &= \vec{AC} + \vec{CD} \\ &= -2\underline{a} - 2\underline{b} \\ &= -2(\underline{a} + \underline{b}) \end{aligned}$$

$ACEF$ is a parallelogram.
 B is the midpoint of AC .
 M is the midpoint of BE .

$$\vec{CB} = \underline{a}$$

$$\vec{ED} = \underline{b}$$

$$\vec{DC} = 2\underline{b}$$

Show that AMD is a straight line.

$$\begin{aligned} \vec{BE} &= \vec{BC} + \vec{CE} \\ &= -\underline{a} - 3\underline{b} \end{aligned}$$

$$\vec{BM} = -\frac{1}{2}\underline{a} - \frac{3}{2}\underline{b}$$

$$\begin{aligned} \vec{AM} &= \vec{AB} + \vec{BM} \\ &= -\underline{a} - \frac{1}{2}\underline{a} - \frac{3}{2}\underline{b} \end{aligned}$$

$$\vec{AM} = -\frac{3}{2}\underline{a} - \frac{3}{2}\underline{b} = -\frac{3}{2}(\underline{a} + \underline{b})$$

\vec{AD} is therefore a multiple of \vec{AM}

$\therefore AMD$ is a straight line.

(Total for Question 20 is 5 marks)



P 4 5 8 2 8 A 0 2 1 2 4