

1. a. Let  $\underline{a} = \overrightarrow{OA}$ ,  $\underline{b} = \overrightarrow{OB}$ ,  $\lambda\underline{a} = \overrightarrow{OA'}$  and  $\mu\underline{b} = \overrightarrow{OB'}$ . Let  $V$  be the intersection of  $AB'$  and  $A'B$ . Express  $\underline{v}$  in terms of  $\underline{a}$ ,  $\underline{b}$ ,  $\lambda$  and  $\mu$ .

b. Let  $X$ ,  $Y$  and  $Z$  be the midpoints of  $OV$ ,  $AB$  and  $A'B'$  respectively. Show that  $X$ ,  $Y$  and  $Z$  are collinear.  
Hint: show that  $\underline{x} - \underline{z} = \lambda\mu(\underline{x} - \underline{y})$ .

