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| **Vector Proof – Equating Coefficients** |
| **(a)** | **(b)** | **(c)** |
| $OABC$ is a quadrilateral, where $\vec{OC}=3a, \vec{OA}=a+2b$ and $\vec{AB}=2a-\frac{1}{2}b$. The point $D$ is on $OB$ and $AC$ such that$OD : OB=λ: 1$ and $AD : AC=μ: 1.$By finding two ways to express the vector $\vec{OD}$, find the values of $λ$ and $μ$.  | $OABC$ is a trapezium, where $\vec{OC}=10a, \vec{OA}=a-4b$ and $\vec{AB}=5a$. $M$ is the midpoint of the line $BC$. The point $X$ is on $OB$ and $AM$ such that$OX : OB=λ: 1$ and $AX : AM=μ: 1.$Find the values of $λ$ and $μ $and the vector $\vec{OX}$ in terms of $a$ and $b$. | In the triangle $OAB,$ $\vec{OB}=5b$and $\vec{OM}=2a+2b,$where $M$ is the midpoint of $OB$. $OC$ is the line OB produced and $\vec{OB}=\vec{BC}$. The point $X$ is on the line $AB$ such that $AX :AB=λ :1$. Given that $MXC$ is a straight line, find the value of $λ$ $ $and the vector $\vec{MX}$ in terms of $a$ and $b$. |

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