24	$(\overrightarrow{ON} =)\lambda(\mathbf{a}+\mathbf{b})(=\lambda\mathbf{a}+\lambda\mathbf{b})$ **or** $(\overrightarrow{NY} =)(1-\lambda)(\mathbf{a}+\mathbf{b})(=(1-\lambda)\mathbf{a}+(1-\lambda)\mathbf{b})$		5	M1 for finding a vector for $\overrightarrow{ON}$ **or** $\overrightarrow{NY}$ **or** $\overrightarrow{NO}$ **or** $\overrightarrow{YN}$ in terms **a** and **b** and using λ oe (can be embedded)
	$(\overrightarrow{MN}=\overrightarrow{MO}+\overrightarrow{ON}=)-0.5\mathbf{a}+\lambda\mathbf{a}+\lambda\mathbf{b}(=(\lambda-0.5)\mathbf{a}+\lambda\mathbf{b})$ **or** $(\overrightarrow{MZ}=\overrightarrow{MO}+\overrightarrow{OZ}=)-0.5\mathbf{a}+3\mathbf{b}$ **or** $(\overrightarrow{MN}=\overrightarrow{MX}+\overrightarrow{XY}+\overrightarrow{YN}=)0.5\mathbf{a}+\mathbf{b}+(\lambda-1)(\mathbf{a}+\mathbf{b})(=(\lambda-0.5)\mathbf{a}+\lambda\mathbf{b})$			M1 for finding a vector for $\overrightarrow{MN}$ **or** $\overrightarrow{NM}$ **or** $\overrightarrow{MZ}$ **or** $\overrightarrow{ZM}$
	$(\overrightarrow{MN}=\mu\overrightarrow{MZ}=)\mu(-0.5\mathbf{a}+3\mathbf{b})(=-0.5\mu\mathbf{a}+3\mu\mathbf{b})$ **or** $(\overrightarrow{ON}=\overrightarrow{OM}+\overrightarrow{MN}=)0.5\mathbf{a}+\mu(-0.5\mathbf{a}+3\mathbf{b})(=(0.5-0.5\mu)\mathbf{a}+3\mu\mathbf{b})$ **or** $(\overrightarrow{NY}=\overrightarrow{NM}+\overrightarrow{MX}+\overrightarrow{XY}=)-\mu(-0.5\mathbf{a}+3\mathbf{b})+0.5\mathbf{a}+\mathbf{b}(=(0.5+0.5\mu)\mathbf{a}+(1-3\mu)\mathbf{b})$			M1 for finding a vector for $\overrightarrow{MN}$ or $\overrightarrow{ON}$ or $\overrightarrow{NY}$ or $\overrightarrow{NM}$ or $\overrightarrow{NO}$ or $\overrightarrow{YN}$ using another variable e.g. μ oe
	$-0.5\mu=-0.5+\lambda$ oe $3\mu=\lambda$ oe	$1-\lambda=0.5\mu+0.5$ oe $1-\lambda=1-3\mu$ oe		M1 for setting up **two** simultaneous equations using the components of **a** and **b** for $\overrightarrow{MN}$ or $\overrightarrow{ON}$ or $\overrightarrow{NY}$ oe
		$\frac{3}{7}$		A1 (allow $\frac{3}{7}$ = 0.42(8571…) to 2 sf truncated or rounded)
				Total 5 marks

24 **ALT**	$(\overrightarrow{ON} =)\lambda(\mathbf{a}+\mathbf{b})(=\lambda\mathbf{a}+\lambda\mathbf{b})$ **or** $(\overrightarrow{NY} =)(1-\lambda)(\mathbf{a}+\mathbf{b})(=(1-\lambda)\mathbf{a}+(1-\lambda)\mathbf{b})$		5	M1 for finding a vector for $\overrightarrow{ON}$ **or** $\overrightarrow{NY}$ **or** $\overrightarrow{NO}$ **or** $\overrightarrow{YN}$ in terms **a** and **b** and using λ oe
	$(\overrightarrow{MN}=\overrightarrow{MO}+\overrightarrow{ON}=)-0.5\mathbf{a}+\lambda\mathbf{a}+\lambda\mathbf{b}(=(\lambda-0.5)\mathbf{a}+\lambda\mathbf{b})$ **or** $(\overrightarrow{MN}=\overrightarrow{MX}+\overrightarrow{XY}+\overrightarrow{YN}=)0.5\mathbf{a}+\mathbf{b}+(\lambda-1)(\mathbf{a}+\mathbf{b})(=(\lambda-0.5)\mathbf{a}+\lambda\mathbf{b})$			M1 for finding a vector for $\overrightarrow{MN}$ **or** $\overrightarrow{NM}$ in terms **a** and **b** and using λ oe
	$(\overrightarrow{NZ}=\overrightarrow{NO}+\overrightarrow{OZ}=)-\lambda(\mathbf{a}+\mathbf{b})+3\mathbf{b}(=-\lambda\mathbf{a}+(3-\lambda)\mathbf{b})$ **or** $(\overrightarrow{NZ}=\overrightarrow{NY}+\overrightarrow{YZ}=)(1-\lambda)(\mathbf{a}+\mathbf{b})-\mathbf{b}-\mathbf{a}+3\mathbf{b}(=-\lambda\mathbf{a}+(3-\lambda)\mathbf{b})$			M1 for finding a vector for $\overrightarrow{NZ}$ or $\overrightarrow{ZN}$ in terms **a** and **b** and using λ oe
	$\frac{\lambda-0.5}{-\lambda}=\frac{\lambda}{3-\lambda}$ oe			M1 for setting up an equation using the components of $\overrightarrow{MN}$ and $\overrightarrow{NZ}$ oe
		$\frac{3}{7}$		A1 (allow $\frac{3}{7}$ = 0.42(8571…) to 2 sf truncated or rounded)
				Total 5 marks

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