



$$3) \vec{a} \left(\frac{2\mu - \frac{1}{2}\lambda}{5} \right) + \vec{b} \left(\frac{1 - \mu - \frac{1}{2}\lambda}{2} \right) = \vec{0}$$

$$\vec{a} \cdot 0 + \vec{b} \cdot 0 = \vec{0}$$

$$\begin{cases} \frac{2\mu - \frac{1}{2}\lambda}{5} = 0 \\ \frac{1 - \mu - \frac{1}{2}\lambda}{2} = 0 \end{cases}$$

$$\begin{cases} 2\mu - \frac{1}{2}\lambda = 0 \\ 1 - \mu - \frac{1}{2}\lambda = 0 \end{cases}$$

1) ΔABC

$$\frac{AG}{G_1B} = \frac{2}{3} \quad \frac{CA}{A_1B} = \frac{1}{1}$$

$$\frac{AG}{AA_1} = \frac{2}{3} \quad \frac{CG}{CC_1} = \frac{2}{3}$$

$$\vec{AB} = \vec{a}$$

$$\vec{AC} = \vec{b}$$

$$\vec{AA_1} = \frac{1}{2}\vec{a} + \frac{1}{2}\vec{b}$$

$$\vec{CC_1} = -\vec{b} + \frac{2}{2+3}\vec{a}$$

2) $G \in \vec{AA_1} \Rightarrow \vec{AG} \parallel \vec{AA_1} \Rightarrow \vec{AG} = \lambda \vec{AA_1}$

$$\vec{AG} = \lambda \left(\frac{1}{2}\vec{a} + \frac{1}{2}\vec{b} \right)$$

$G \in \vec{CC_1} \Rightarrow \vec{CG} \parallel \vec{CC_1} \Rightarrow \vec{CG} = \mu \vec{CC_1}$

$$\vec{CG} = \mu \left(-\vec{b} + \frac{2}{5}\vec{a} \right)$$

$$\vec{b} + \vec{CG} = \vec{AG}$$

$$\vec{b} + \mu \left(-\vec{b} + \frac{2}{5}\vec{a} \right) = \lambda \left(\frac{1}{2}\vec{a} + \frac{1}{2}\vec{b} \right)$$

$$\vec{b} - \mu\vec{b} + \frac{2}{5}\vec{a}\mu = \frac{1}{2}\vec{a}\lambda + \frac{1}{2}\vec{b}\lambda$$

$$\vec{b} - \mu\vec{b} + \frac{2}{5}\vec{a}\mu - \frac{1}{2}\vec{a}\lambda - \frac{1}{2}\vec{b}\lambda = \vec{0}$$

$$\mu = \frac{1}{2}\lambda \cdot \frac{2}{5}$$

$$\mu = \frac{1}{5}\lambda$$

$$\mu = \frac{5\lambda}{4}$$

$$1 - \frac{5\lambda}{4} - \frac{1}{2}\lambda = 0$$

$$1 - \frac{5\lambda}{4} - \frac{2\lambda}{4} = 0$$

$$1 - \frac{7\lambda}{4} = 0$$

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$\lambda = \frac{4}{7}$	$\mu = \frac{5 \cdot 4}{4 \cdot 7} = \frac{5}{7}$
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