

$$\overrightarrow{A'B'} = \overrightarrow{AB} - w_2 \overrightarrow{AB}$$

$$\overrightarrow{A'C'} = w_1 \overrightarrow{AC}$$

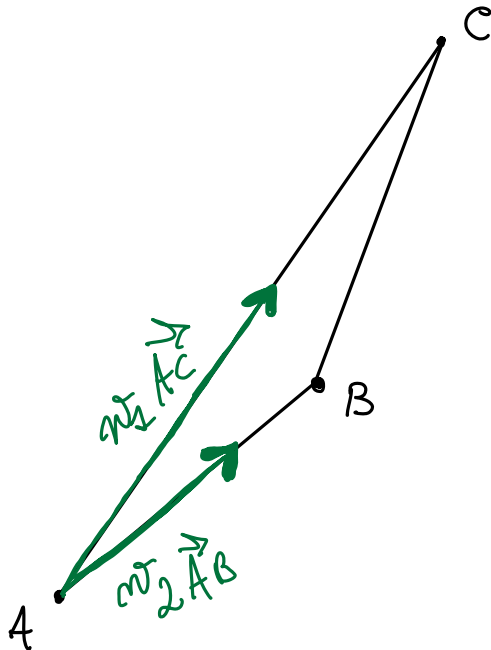
$$\frac{\overrightarrow{A'B'}}{\overrightarrow{AB}} = \frac{\overrightarrow{A'C'}}{\overrightarrow{AC}}$$

$$\frac{\overrightarrow{AB} - w_2 \overrightarrow{AB}}{\overrightarrow{AB}} = \frac{w_1 \overrightarrow{AC}}{\overrightarrow{AC}}$$

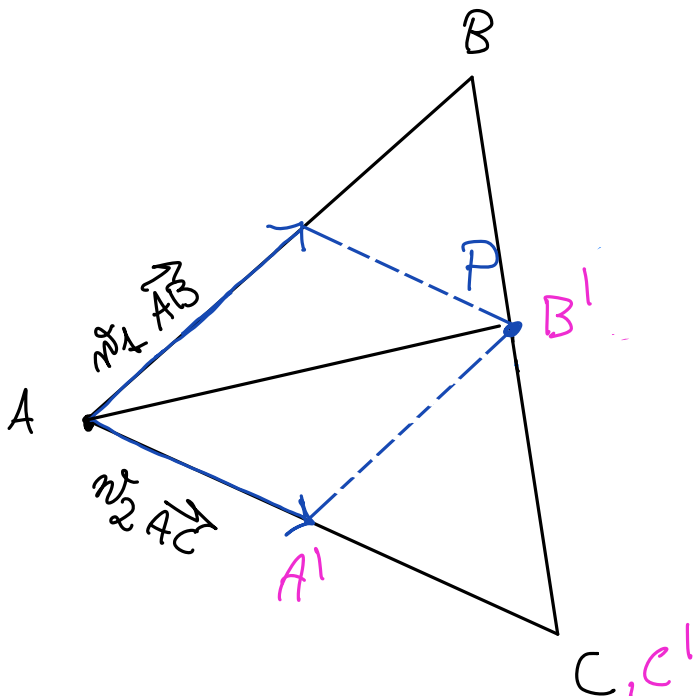
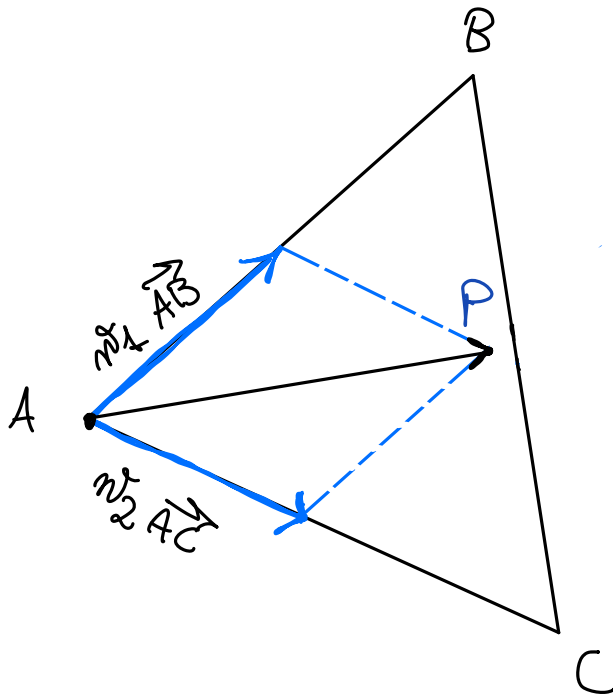
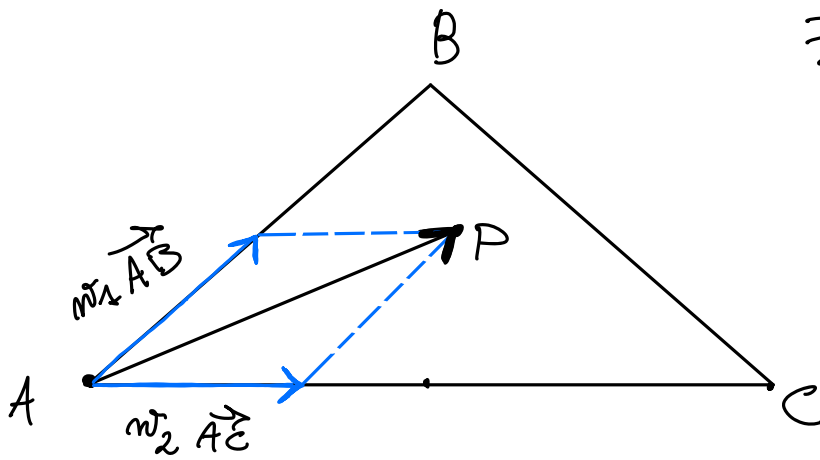
$$\frac{\cancel{\overrightarrow{AB}} - w_2 \cancel{\overrightarrow{AB}}}{\cancel{\overrightarrow{AB}}} = \frac{w_1 \cancel{\overrightarrow{AC}}}{\cancel{\overrightarrow{AC}}}$$

$$1 - w_2 = w_1$$

$$w_1 + w_2 = 1$$



$$\vec{P} = w_1 \vec{AB} + w_2 \vec{AC}$$



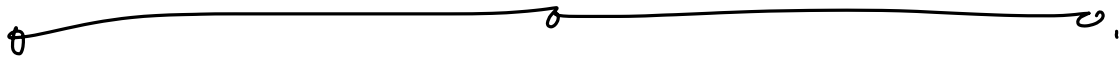
$$\overline{A'B'} = w_1 \overline{AB}$$

$$\overline{A'C'} = \overline{AC} - w_2 \overline{AC}$$

$$\frac{\overline{A'B'}}{\overline{AB}} = \frac{\overline{A'C'}}{\overline{AC}}$$

$$\frac{w_1 \overline{AB}}{\overline{AB}} = \frac{\overline{AC} - w_2 \overline{AC}}{\overline{AC}}$$

$$w_1 = 1 - w_2 \quad \Leftrightarrow \quad w_1 + w_2 = 1.$$



$$A = (x_A, y_A), \quad B = (x_B, y_B); \quad C = (x_C, y_C)$$

$$P = (x_P, y_P)$$

$$\vec{P} = w_1 \vec{AB} + w_2 \vec{AC}$$

$$\begin{cases} x_P = w_1 x_B + w_2 x_C \\ y_P = w_1 y_B + w_2 y_C \end{cases}$$

$$\begin{cases} x_P - x_A = w_1 (x_B - x_A) + w_2 (x_C - x_A) \\ y_P - y_A = w_1 (y_B - y_A) + w_2 (y_C - y_A) \end{cases}$$

$$\begin{cases} x_P = x_A + w_1(x_B - x_A) + w_2(x_C - x_A) \\ y_P = y_A + w_1(y_B - y_A) + w_2(y_C - y_A) \end{cases}$$

$$w_2 = \frac{y_P - y_A - w_1(y_B - y_A)}{y_C - y_A}$$

$$x_P = x_A + w_1(x_B - x_A) + \frac{y_P - y_A - w_1(y_B - y_A)}{y_C - y_A} (x_C - x_A)$$

$$\begin{aligned} x_P(y_C - y_A) &= x_A(y_C - y_A) + w_1(x_B - x_A)(y_C - y_A) \\ &\quad + (y_P - y_A)(x_C - x_A) \\ &\quad - w_1(y_B - y_A)(x_C - x_A) \end{aligned}$$

$$(y_C - y_A)(x_P - x_A) - (y_P - y_A)(x_C - x_A)$$

$$= w_1 \left( (x_B - x_A)(y_C - y_A) - (y_B - y_A)(x_C - x_A) \right)$$

$$m_1 = \frac{(y_c - y_A)(x_P - x_A) - (y_P - y_A)(x_c - x_A)}{(x_B - x_A)(y_c - y_A) - (y_B - y_A)(x_c - x_A)}$$