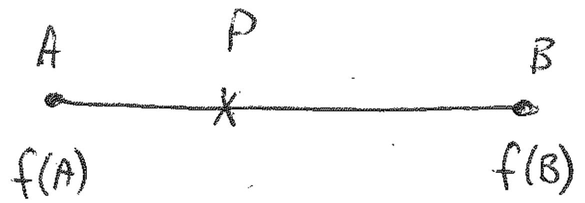


$f(x)$

$\alpha = 1$ $\qquad\qquad$ $\alpha = 0$

$$f(x) = \alpha f(A) + (1-\alpha) f(B) \qquad 0 \le \alpha \le 1$$

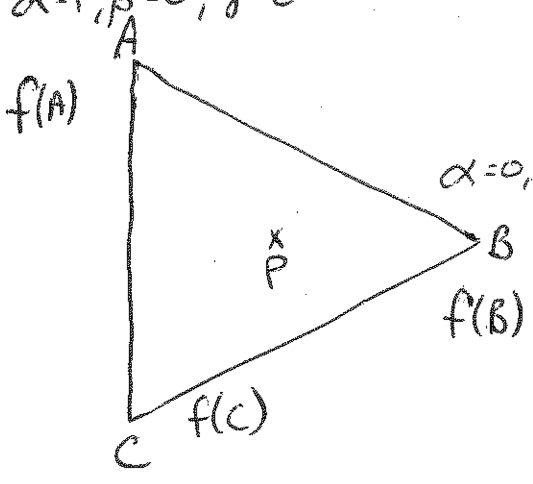
$$= \alpha f(A) + \beta f(B)$$

$$\beta = 1 - \alpha$$

$$\alpha = \frac{\text{len}(BP)}{\text{len}(\cancel{AP}\ BA)}$$

$$\beta = \frac{\text{len}(AP)}{\text{len}(AB)}$$

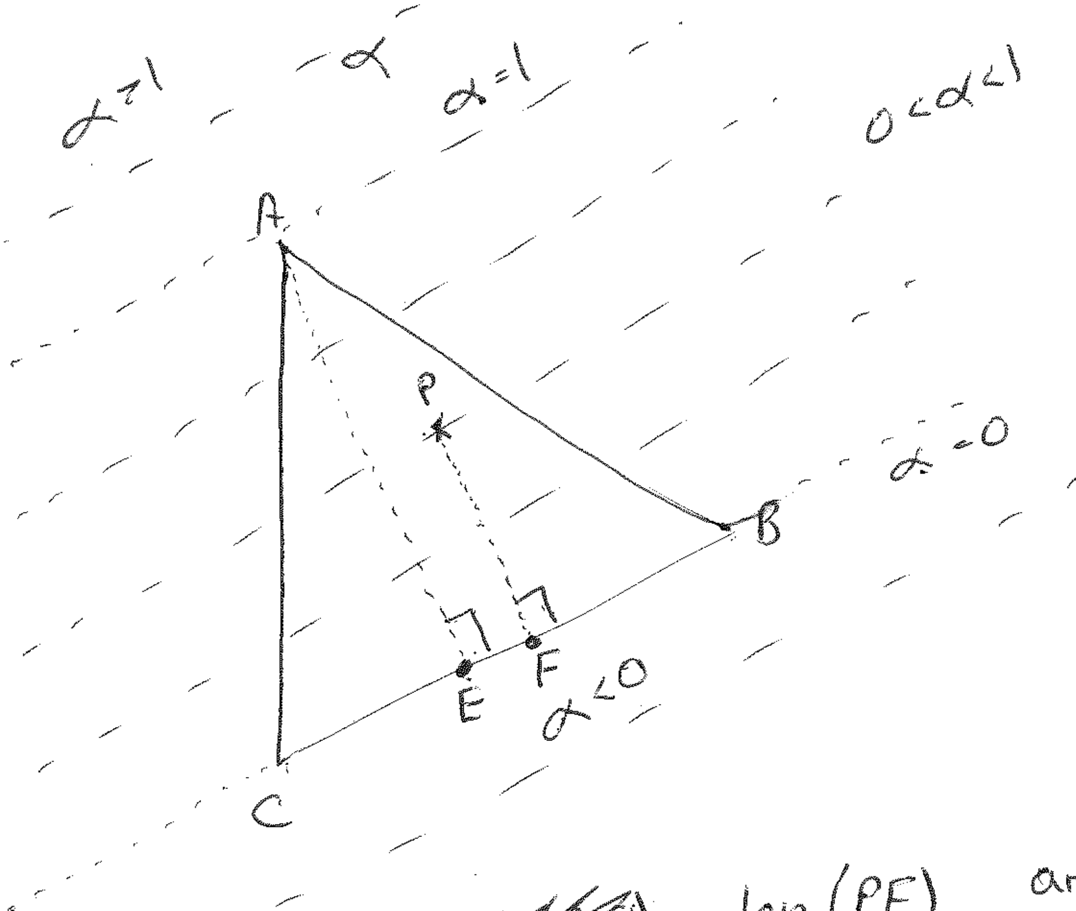
$\alpha = 1, \beta = 0, \gamma = 0$



$\alpha = 0, \beta = 1, \gamma = 0$

$$f(P) = \alpha f(A) + \beta f(B) + \gamma f(C)$$

$\alpha = 0, \beta = 0, \gamma = 1$



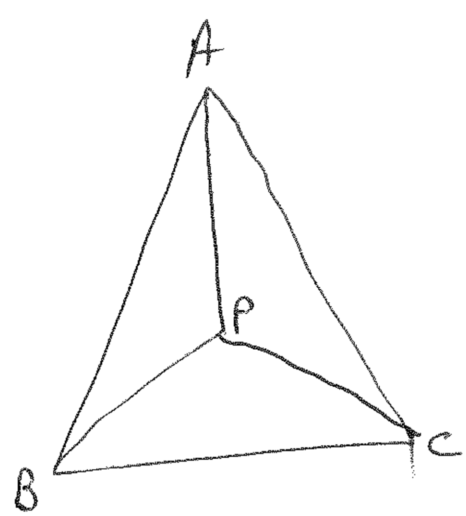
$$\alpha = \cancel{\frac{\text{len}(AE)}{\text{len}(PE)}} \quad \frac{\text{len}(PF)}{\text{len}(AE)} = \frac{\text{area}(PBC)}{\text{area}(ABC)}$$

$$\text{area}(ABC) = \boxed{\tfrac{1}{2}\,\text{len}(BC)}\;\text{len}(AE)$$
$$\text{area}(PBC) = \boxed{\tfrac{1}{2}\,\text{len}(BC)}\;\text{len}(PF)$$

$$\beta = \frac{\text{area}(APC)}{\text{area}(ABC)} \qquad \gamma = \frac{\text{area}(ABP)}{\text{area}(ABC)}$$

$$\alpha+\beta+\gamma = \frac{\text{area}(PBC)+\text{area}(APC)+\text{area}(ABP)}{\text{area}(ABC)}$$

$$= 1$$



inside: $\alpha \in [0,1]$
$\beta \in [0,1]$
$\gamma \in [0,1]$

$$\alpha = \frac{\text{area}(PBC)}{\text{area}(ABC)}$$

$$A = \begin{pmatrix} a_x \\ a_y \end{pmatrix} \quad B = \begin{pmatrix} b_x \\ b_y \end{pmatrix} \quad C = \begin{pmatrix} c_x \\ c_y \end{pmatrix}$$

$$\text{area} = \frac{1}{2}\left(a_x b_y - a_y b_x + b_x c_y - b_y c_x + c_x a_y - c_y a_x\right)$$

$$\text{area}(PBC) \qquad x(b_y - c_y) + y(c_x - b_x) + (b_x c_y - b_y c_x)$$

$$x \to x+1$$

$$\text{area} \to \text{area} + (b_y - c_y)$$

$$\alpha \to \alpha + \underbrace{\frac{b_y - c_y}{\text{area}(ABC)}}_{\Delta\alpha}$$

$$\alpha \mathrel{+}= \Delta\alpha$$
$$\beta \mathrel{+}= \Delta\beta$$
$$\gamma \mathrel{+}= \Delta\gamma$$

$$c = \alpha c_0 + \beta c_1 + \gamma c_2$$

$$c \mathrel{+}= \underbrace{\Delta\alpha c_0 + \Delta\beta c_1 + \Delta\gamma c_2}_{\Delta c}$$