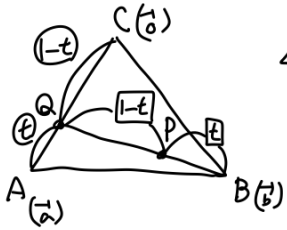
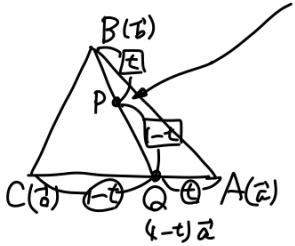
LV 4.5

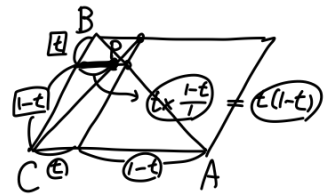


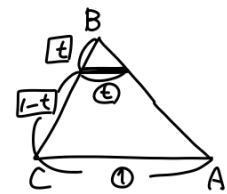
$\triangle ABC = S$

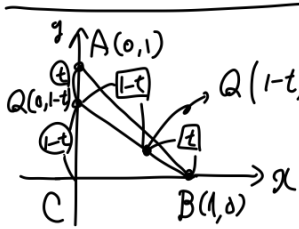


$\vec{CQ} = t(1-t)\vec{a} + (1-t)\vec{b}$

$= (1-t)(t\vec{a} + \vec{b})$





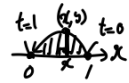


→ どこに取っても比の情報は不変 $S = \frac{1}{2}$

$Q: \begin{cases} x = 1-t \\ y = t-t^2 \end{cases}$ $(0<t<1)$

こういうのは受験生だけ"一般的"ではない？

$\frac{dx}{dt} = -1 < 0$, $y = t(1-t) > 0$ より

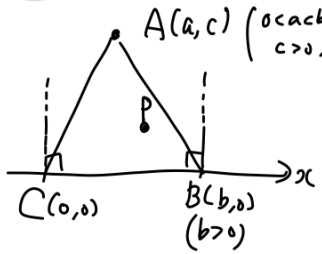


$= \int_0^1 y\,dx$

$= \int_1^0 (t-t^2)(-dt)$

$= \frac{1}{2} - \frac{1}{3}$

$= \frac{1}{6} = \frac{1}{3}S$



$\vec{CP} = t(1-t)\begin{pmatrix} a \\ c \end{pmatrix} + (1-t)\begin{pmatrix} b \\ 0 \end{pmatrix}$

$= \begin{pmatrix} at(1-t) + b(1-t) \\ ct(1-t) \end{pmatrix}$

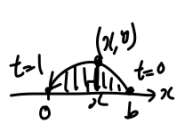
$= \begin{pmatrix} -at^2 + (a-b)t + b \\ -ct^2 + ct \end{pmatrix}$

$S = \frac{1}{2} \cdot b \cdot c$

$P: \begin{cases} x = at(1-t) + b(1-t) \\ y = ct(1-t) \end{cases}$

$\frac{dx}{dt} = a(1-2t) - b = -2at - (b-a) < 0$

$y > 0$



$= \int_0^b y\,dx = \int_1^0 ct(1-t)\{a(1-2t)-b\}dt$

$= -c\int_0^1 (t-t^2)(-2at+a-b)\,dt$

$= -c\left(\frac{2a}{6} + \frac{-2a+b}{3} + \frac{a-b}{2}\right)$

$= \frac{1}{6}bc = \frac{1}{3}S$

		−1	1	0
×	1	−2a	a−b	
		−a+b	a−b	
	2a	−2a		
	2a	−3a+b	a−b	0