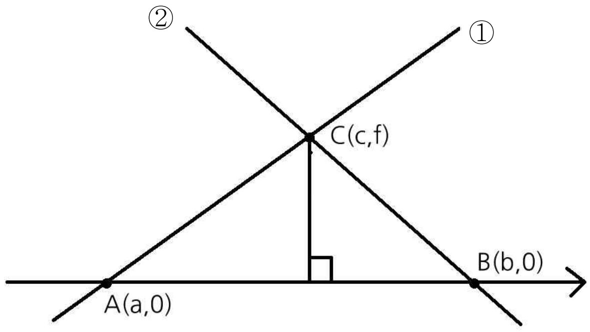

$\triangle ABC = \frac{1}{2}f(b-a) = 1$ $\left(\because \int_a^b f(x)dx = 1\right)$

① $y = \frac{f}{c-a}x - \frac{af}{c-a}$

② $y = -\frac{f}{b-c}x + \frac{bf}{b-c}$

$E(x) = \frac{1}{3}(a+b+c)$? 과연

$E(x) = \int xf(x)dx$ **(여기 f(x)만 함수이고 나머지는 다 좌표 C의 y좌표입니다.)**

$\int_a^c x\left(\frac{f}{c-a}x - \frac{af}{c-a}\right)dx + \int_c^b x\left(-\frac{f}{b-c}x + \frac{bf}{b-c}\right)dx$

$= \int_a^c \left(\frac{f}{c-a}x^2 - \frac{af}{c-a}x\right)dx + \int_c^b \left(-\frac{f}{b-c}x^2 + \frac{bf}{b-c}x\right)dx$

$= \left[\frac{1}{3}\frac{f}{c-a}x^3 - \frac{1}{2}\frac{af}{c-a}x^2\right]_a^c + \left[-\frac{1}{3}\frac{f}{b-c}x^3 + \frac{1}{2}\frac{bf}{b-c}x^2\right]_c^b$

$= \left\{\left(\frac{1}{3}\frac{f}{c-a}c^3 - \frac{1}{2}\frac{af}{c-a}c^2\right) - \left(\frac{1}{3}\frac{f}{c-a}a^3 - \frac{1}{2}\frac{af}{c-a}a^2\right)\right\}$

$+ \left\{\left(-\frac{1}{3}\frac{f}{b-a}b^3 + \frac{1}{2}\frac{bf}{b-c}b^2\right) - \left(-\frac{1}{3}\frac{f}{b-a}c^3 + \frac{1}{2}\frac{bf}{b-c}c^2\right)\right\}$

$= \frac{1}{3}\frac{f(c^3-a^3)}{c-a} - \frac{1}{2}\frac{af(c^2-a^2)}{c-a} - \frac{1}{3}\frac{f(b^3-c^3)}{b-c} + \frac{1}{2}\frac{bf(b^2-c^2)}{b-c}$

$= -\frac{1}{3}f(b^2-a^2) - \frac{1}{3}fc(b-a) + \frac{1}{2}f(b^2-a^2) + \frac{1}{2}fc(b-a)$

($\triangle ABC = \frac{1}{2}f(b-a) = 1$ 이므로)

$= \frac{1}{3}(a+b+c)$