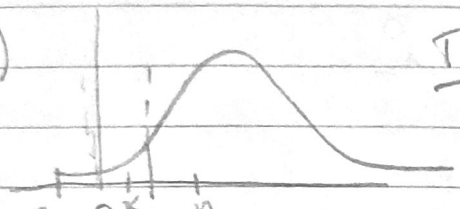
ESPERANZA

$$\mu = E(x) = \int_{-\infty}^{+\infty} t f_x(t)\, dt$$

b)



TR1 $\int_{-\infty}^{2} 0 = 0$ $\boxed{t<0}$

TR2 $\int_{-\infty}^{0} 0 + \int_{0}^{k} t + \frac{3t^2}{2} =$

$= \frac{t^2}{2} + \frac{3t^3}{6} = \frac{t^2}{2} + \frac{t^3}{2} \Big|_0^k =$

$= \boxed{\frac{k^2}{2} + \frac{k^3}{2}}$ $\boxed{0<t<1}$

$$F_x(x) = \begin{cases} 0 & t<0 \\ \frac{t^2+t^3}{2} & 0<t<1 \\ 1 & t>1 \end{cases}$$

TR3 $\int_{-\infty}^{0} 0 + \int_{0}^{1} t + \frac{3t^2}{2} + \int_{1}^{+\infty} 0$

$\frac{t^2}{2} + \frac{t^3}{2} \Big|_0^1 = \frac{1}{2} + \frac{1}{2} = \boxed{1}$

$\boxed{t \geq 1}$

c) $P(1/2 < x < 1)$ =

$\frac{t^2+t^3}{2} \Big|_{1/2}^{1} = 1 - \frac{1}{8} - \frac{1}{4} = 1 - \frac{1}{2} - \frac{1}{4} = \frac{4-2-1}{4}$

$\frac{13}{16}$