Próximo lunes 29 de Octubre
se repone el 2º Examen Parcial
mismos enunciados diferentes
expresiones matemáticas.

Laplace Transform propierties.

7 $$\mathcal{L}^{-1}\left\{ e^{-sa} F(s) \right\} = \begin{cases} 0 \ ; \ t \leq 0 \\ f(t-a) ; \ t > 0 \end{cases}$$

translation in Real Space.

+ Sectional continous function.

Teorema of existance for $\mathcal{L}T$.

A $f(t)$ has Laplace Transform when is "A" class function.

An "A" class function is $f(t)$ when

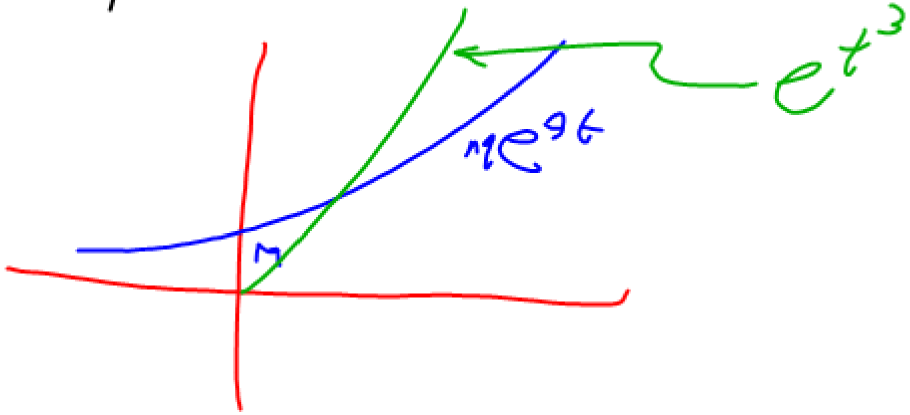
a) $f(t)$ is exponential order function (that means $|f(t)| \leq Me^{At}$ $M, A \in \mathbb{R}$

b) $f(t)$ is sectional continows function (that means there have a finite number of discontinuitees in $a < t < b$ closed interval).

$$e^{at} \qquad t^n \qquad \left\{ \begin{matrix} \cos(bt) \\ \sin(bt) \end{matrix} \right\}$$

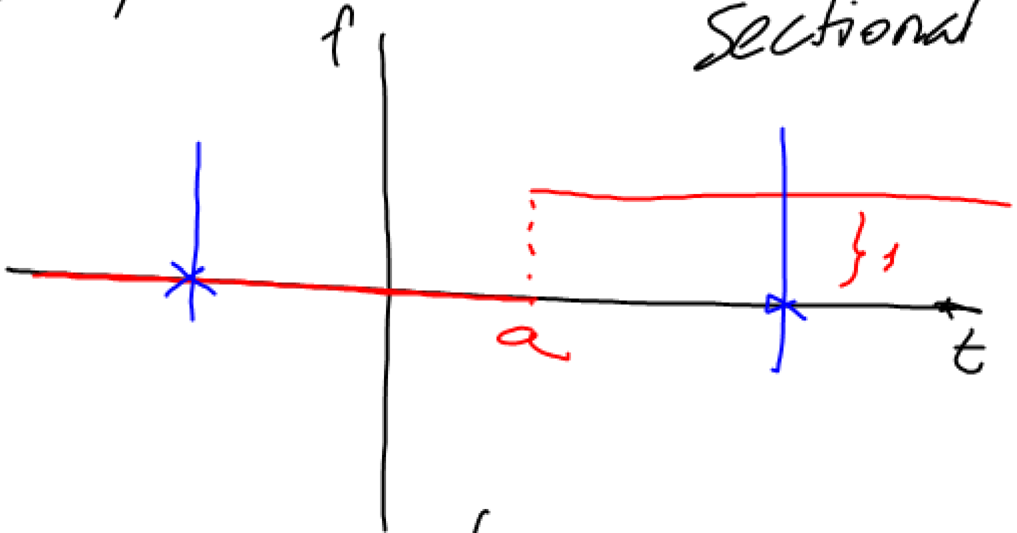
b.e. $\left| e^{t^3} \right| \not\leq M e^{At}$

is not exponential order



Step function

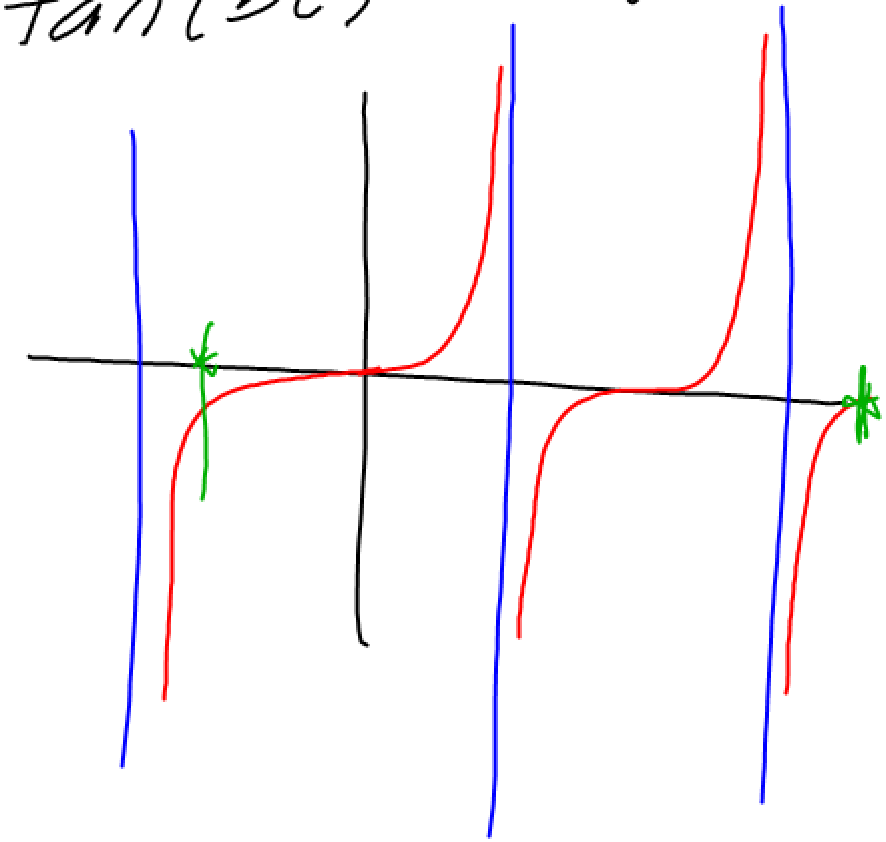
Sectional continuous function



$$u(t-a) = \begin{cases} 0 \; ; & t \leq a \\ 1 \; ; & t > a \end{cases}$$

Heaviside

tan(bt) cot(bt) sec(bt) csc(bt)



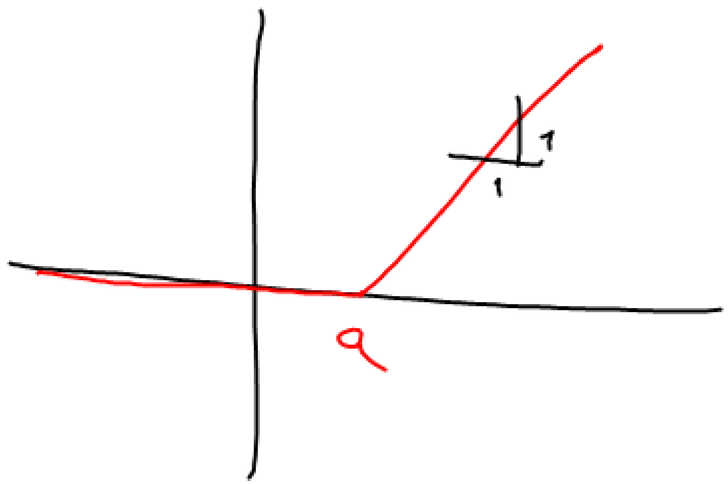
sectional
continous.
functions

step function

$$u(t-a) = \begin{cases} 0 \; ; & t \le a \\ 1 \; ; & t > a \end{cases}$$

slope funtion

$$r(t-a) = \begin{cases} 0 \; ; & t \le a \\ (t-a) \; ; & t > a \end{cases}$$



$$\mathcal{L}^{-1}\left\{\frac{e^{-3s}}{s^3}\right\} = \begin{cases} 0 \,; & t \le 3 \\ \frac{1}{2}(t-3)^2 \,; & t > 3. \end{cases}$$

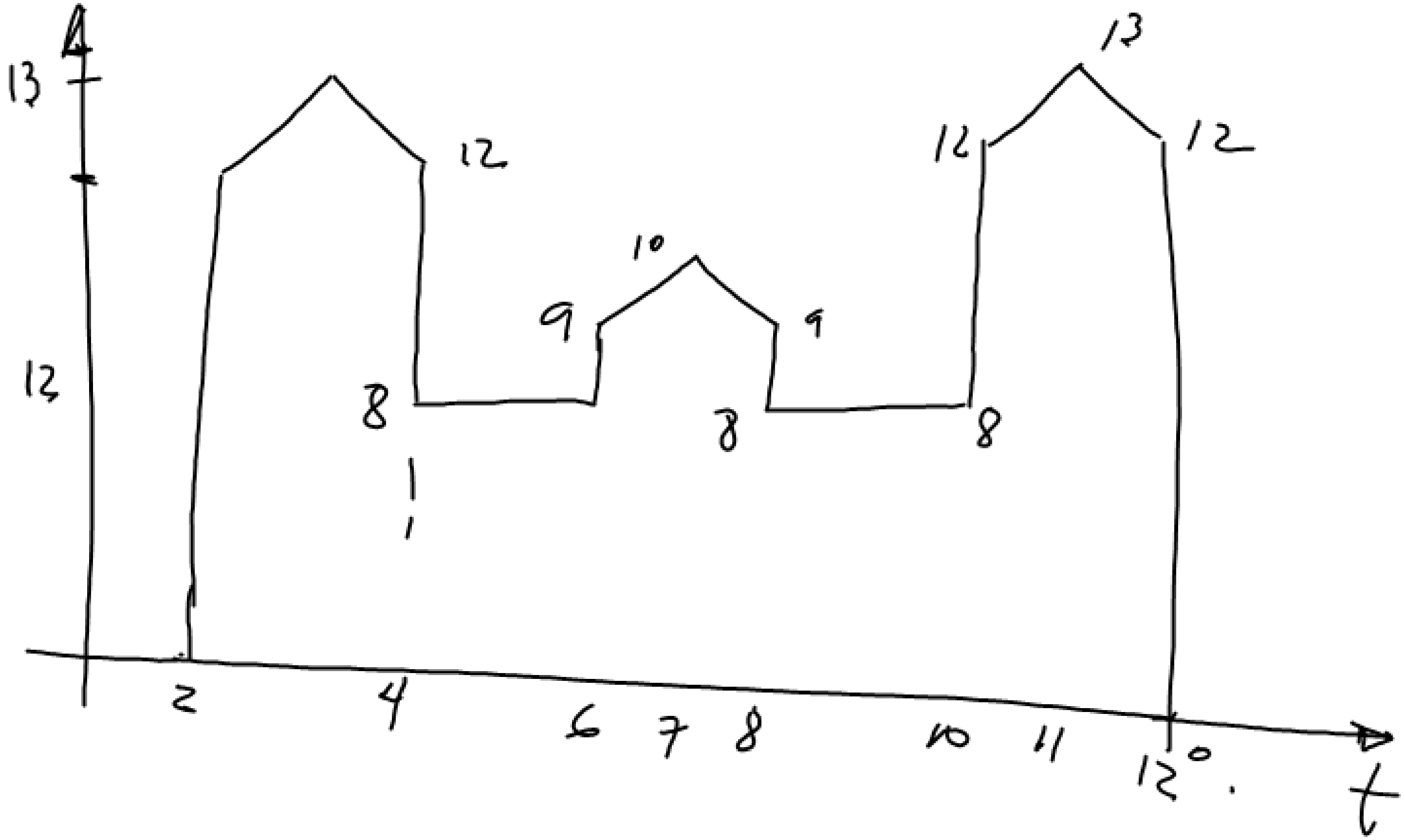
$$\mathcal{L}\left\{\frac{1}{s^3}\right\} = \frac{1}{2}\mathcal{L}^{-1}\left\{\frac{2!}{s^3}\right\}$$

$$= \frac{1}{2}t^2$$

$$\mathcal{L}^{-1}\left\{\frac{e^{-3s}}{s^3}\right\} = \frac{1}{2}(t-3)\cdot u(t-3)$$

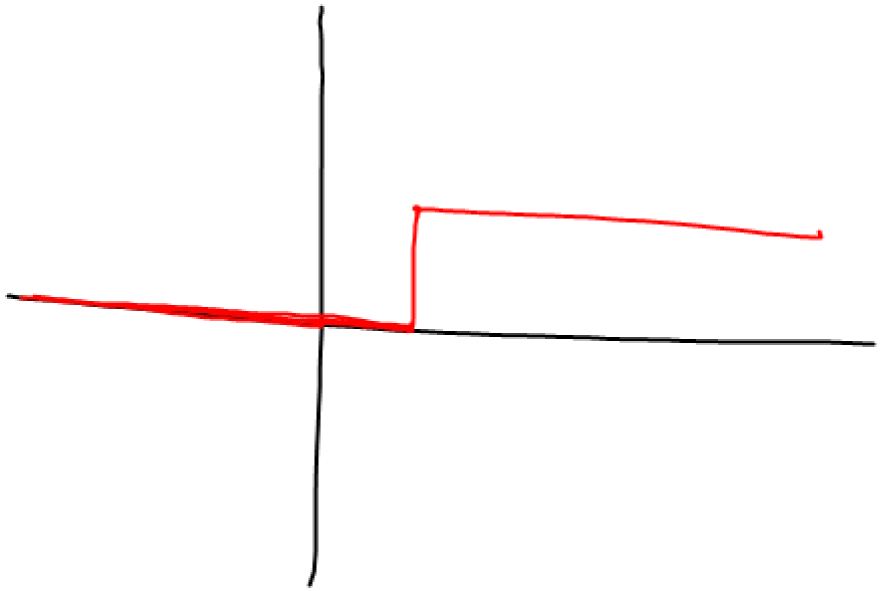
$$u(t-3) = \begin{cases} 0 \,; & t \le 3 \\ 1 \,; & t > 3 \end{cases}$$

Castle.



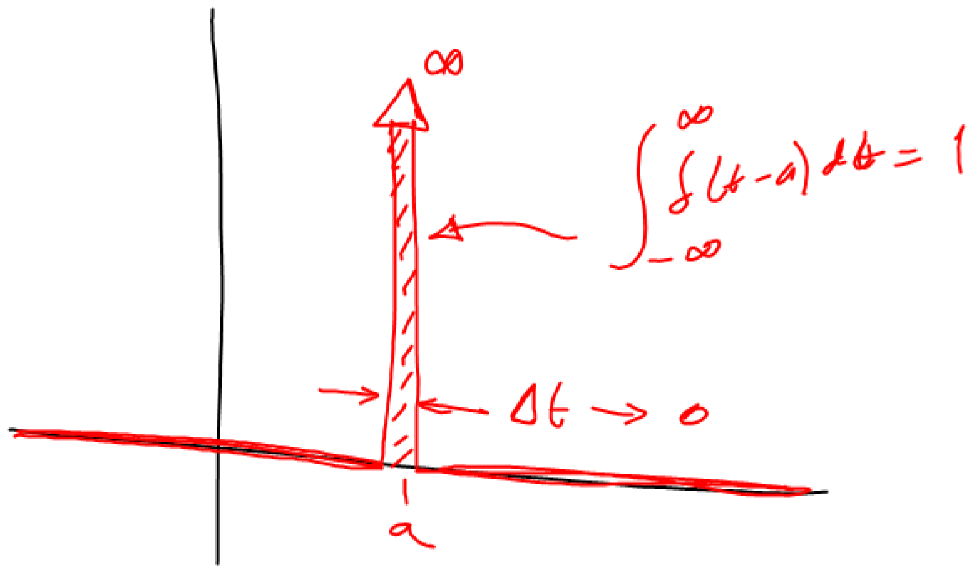
Calculus.

+ all funtion has derivate and Integrate
  if is continows.



Dirac delta

$$\delta(t-a) = \begin{cases} 0; & t \neq a \\ \displaystyle\int_{-\infty}^{\infty} \delta(t-a)\,dt = 1. & \end{cases}$$



$$\mathcal{L}\{u(t-a)\} = \frac{e^{-as}}{s}$$

$$\mathcal{L}\{\delta(t-a)\} = e^{-as}$$

$$\mathcal{L}\{u'(t-a)\} = s\,\mathcal{L}\{u(t-a)\} - \cancelto{0}{u(t-a)}\Big|_{t=0}$$

$$\mathcal{L}\{u'(t-a)\} = \cancel{s}\left[\frac{e^{-as}}{\cancel{s}}\right] - \cancel{(0)}$$

$$\mathcal{L}\{u'(t-a)\} = e^{-as}$$

$$\mathcal{L}\{u'(t-a)\} = \mathcal{L}\{\delta(t-a)\}$$

$$u'(t-a) = \delta(t-a)$$

$$r'(t-a) = u(t-a)$$