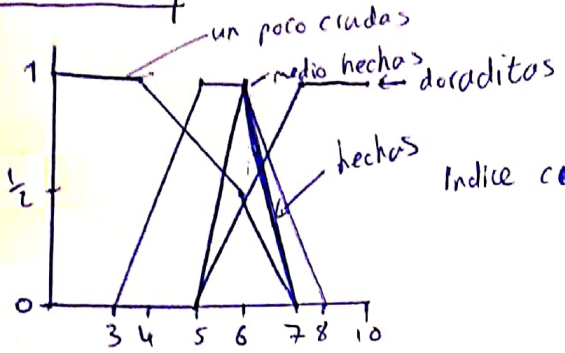
Tarea Lógica Difusa

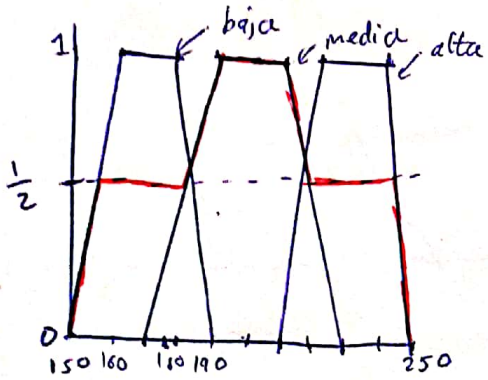
Fernando Javier López Cerezo

Problema 1

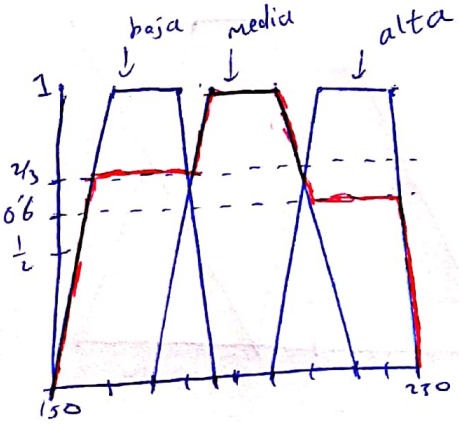
a)



Indice cromático galletas



Temperatura del horno



$z_1 = \mu_{crudas}(6) = 0{,}5$ $\quad z_2 = \mu_{medio}(6) = 1$ $\quad z_3 = \mu_{doraditas}(6) = 0{,}5$

$alta^* = \min(0{,}5, alta)$ $\quad media^* = \min(1, media)$ $\quad baja^* = \min(0{,}5, baja)$

Primer valor máximo: 190°C

b) $z_1 = \max(\min(hechos, crudas)) = 0{,}6$

$x=5\ y=0$, $x=6\ y=1$ $\quad y = x - 5$ $\quad x-5 = -\frac{1}{4}x + 2 \Rightarrow x = \frac{28}{5}$

$x=4\ y=1$, $x=6\ y=\frac{1}{2}$ $\quad y = -\frac{1}{4}x + \frac{3}{2}2$ $\quad \Rightarrow y = 0{,}6$

$z_2 = \max(\min(hechos, medio\ hechos)) = 1$

$z_3 = \max(\min(hechos, doraditos)) = \frac{2}{3}$

$x=5\ y=0$, $x=7\ y=1$ $\quad y = 2x\frac{1}{2}x - \frac{5}{2}$ $\quad y = -x + 7$ $\quad \frac{1}{2}x - \frac{5}{2} = -x + 7 \Rightarrow x = \frac{19}{3}$

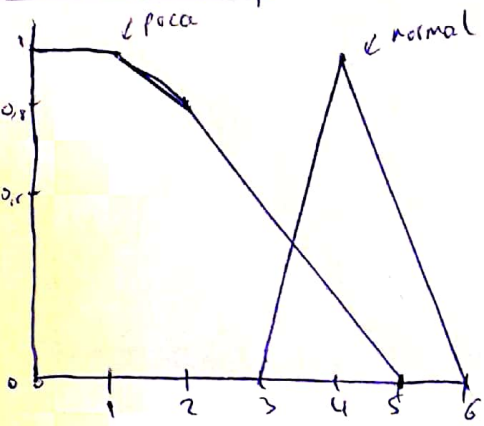
$y = \frac{2}{3}$

$alta^* = \min(0{,}6, alta)$ $\quad media^* = \min(1, media)$ $\quad baja^* = (\frac{2}{3}, baja)$

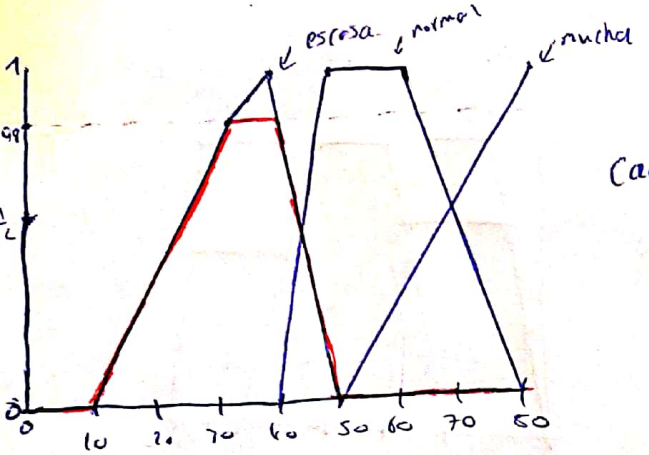
Media valores máximos: 200°C

Escaneado con CamScanner

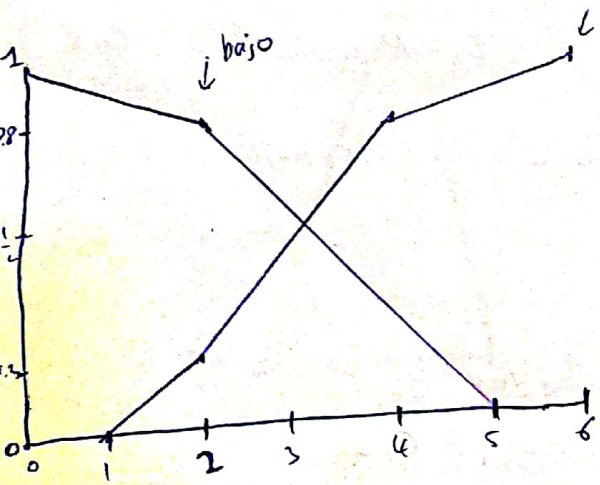
Problema 2



cantidad ropa



cantidad detergente



grado suciedad

$z_1 = \max(z_{11}, z_{12}) = 0,8$

$z_{12} = 0,8$ $\quad z_{11} = (0.8)^2 = 0.64$

$z_2 = \min(z_{21}, z_{22}) = 0.2$

$z_{21} = 0,8$

$z_{22} = 0.2$

$z_3 = \min(z_{31}, z_{32}) = 0$

$z_{31} = 0$

$z_{41} = \min(z_{41}, z_{42}) = 0$

$z_{41} = 0$

escasa* = min(0,8, escasa)

$y = \frac{1}{10}x + 5$

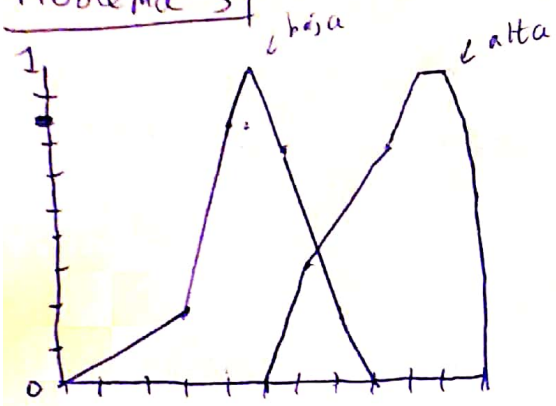
normal* = min(0.2, 0, normal)

mucha* = min(0, mucha)

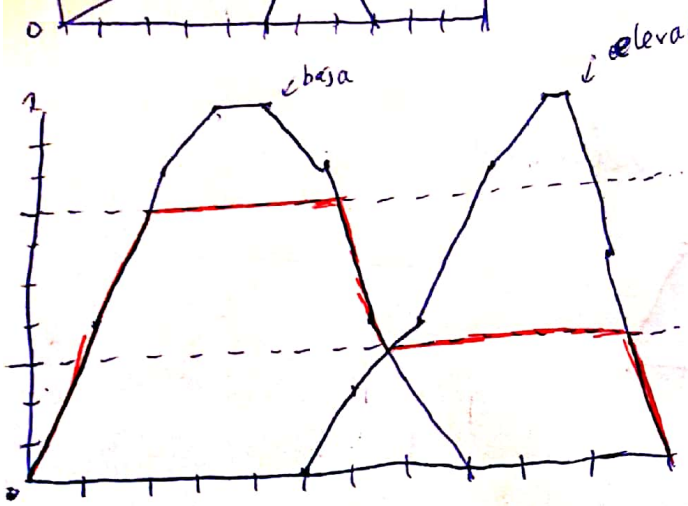
media valores máximos = $\frac{42+30}{2} = 36$

Escaneado con CamScanner

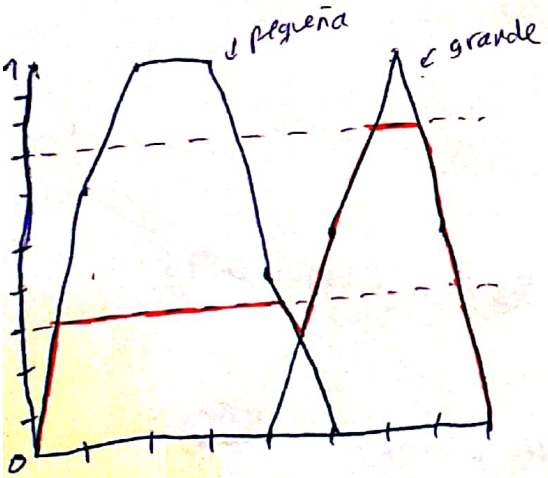
Problema 3



Temperatura



Presión



Combustible

$z_1 = \mu_{alta}(60) = 0,3$ $\quad z_2 = \mu_{baja}(60) = 0,7$

$baja^* = min(0.3, baja)$ $\quad elevada^* = min(0.7, elevada)$

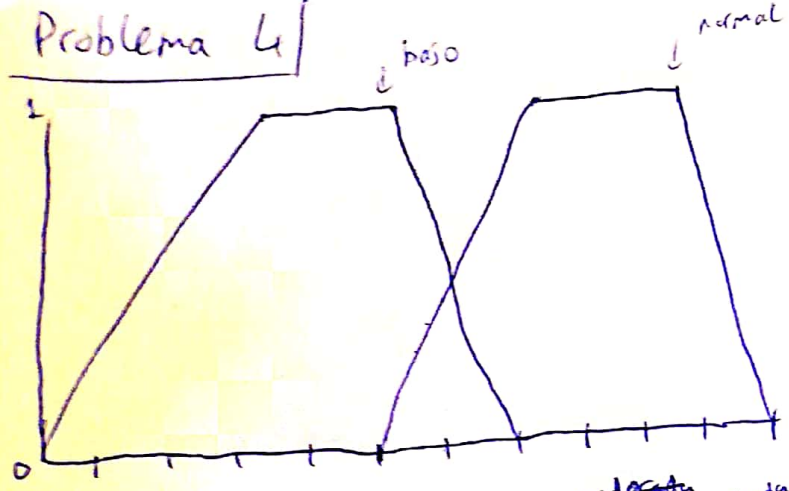
$z_3 = max(min(baja, baja^* \cup elevada^*)) = 0,7$ $\quad z_4 = max(min(elevado, baja^* \cup elevado^*)) = 0,3$

$pequeña^* = min(0,3, pequeña)$ $\quad grande^*$ ~~$=$~~ $min(0,7, grande)$

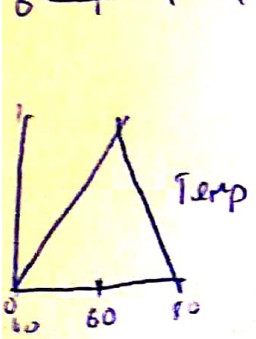
$y = \frac{1}{2}x + 2$ $\quad$ Primer valor máximo: 5.4

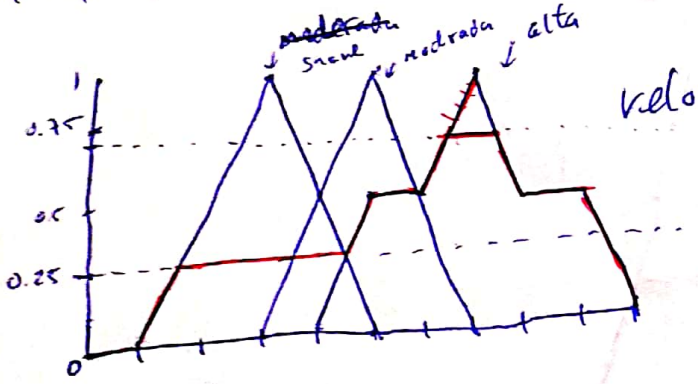
Escaneado con CamScanner

Problema 4

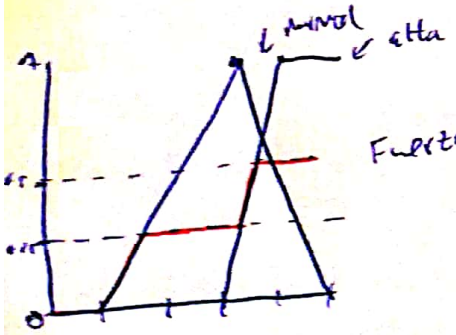


nivel de ruido





velocidad



Fuerza de frenado

$z_1 = \min(z_{11}, z_{12}) = 0,25$

$z_{11} = 0,25 \quad z_{12} = 0,5$

$z_2 = \min(z_{21}, z_{22}) = 0,25$

$z_{21} = 0,25 \quad z_{22} = 0,5$

$z_3 = \mu_{bajo}(5,5) = 0,75$

suave* = min (0,25, suave)

moderada* = min (0,75, moderada)

alta* = min (0,75, ~~suave~~ alta)

$z_4 = \max(\min(\text{suave}, U^*)) = 0,25$

$z_5 = \max(\min(\text{moderada}, U^*)) = 0,5$

$z_6 = \max(\min(\text{alta}, U^*)) = 0,75$

normal* = min (0,25, normal)

alta* = min (0.5, 0.75, alta)

media valores máximos = $\frac{5}{6} + 3,75 = 4,375$

Escaneado con CamScanner