1) Resolver el siguiente juego de dos jugadores por metodo grafico.

I \ II	y_1	y_2	y_3	y_4
x_1	4	2	5	-6
x_2	-7	4	-8	3

r_1 $E(I;y_1) = 4x_1 - 7x_2 = 4x_1 + (\rightarrow).(1-x_1) = 11x_1 - 7$

r_2 $E(I;y_2) = 2x_1 + 4x_2 = 2x_1 + 4.(1-x_1) = -2x_1 + 4$

r_3 $E(I;y_3) = 5x_1 - 8x_2 = 5x_1 + (-8).(1-x_1) = 13x_1 - 8$

r_4 $E(I;y_4) = -6x_1 + 3x_2 = -6x_1 + 3.(1-x_1) = -9x_1 + 3$

Puntos gráfico:

r_1 $11.0 - 7 = -7$ $\quad 11.1 - 9 = 4$

r_2 $-2x0 + 4 = 4$ $\quad -2.1 + 4 = 2$

r_3 $13.0 - 8 = -8$ $\quad 13.1 - 8 = 5$

r_4 $-9.0 + 3 = 3$ $\quad -9.1 + 3 = -6$

Punto intermedio

r_1 $0 = 11x_1 - 7$

$7 = 11x_1$

$\frac{7}{11} = x_1$

r_3 $0 = 13x_1 - 8$

$8 = 13x_1$

$\frac{8}{13} = x_1$

r_4 $0 = -9x_1 + 3$

$9x_1 = 3$

$x_1 = \frac{1}{3}$

Punto más bajo

$\begin{cases} E = 13x_1 - 8 \\ E = -9x_1 + 3 \end{cases} = -\frac{3}{2}$

$13x_1 - 8 = -9x_1 + 3$

$13x_1 + 9x_1 = 3 + 8$

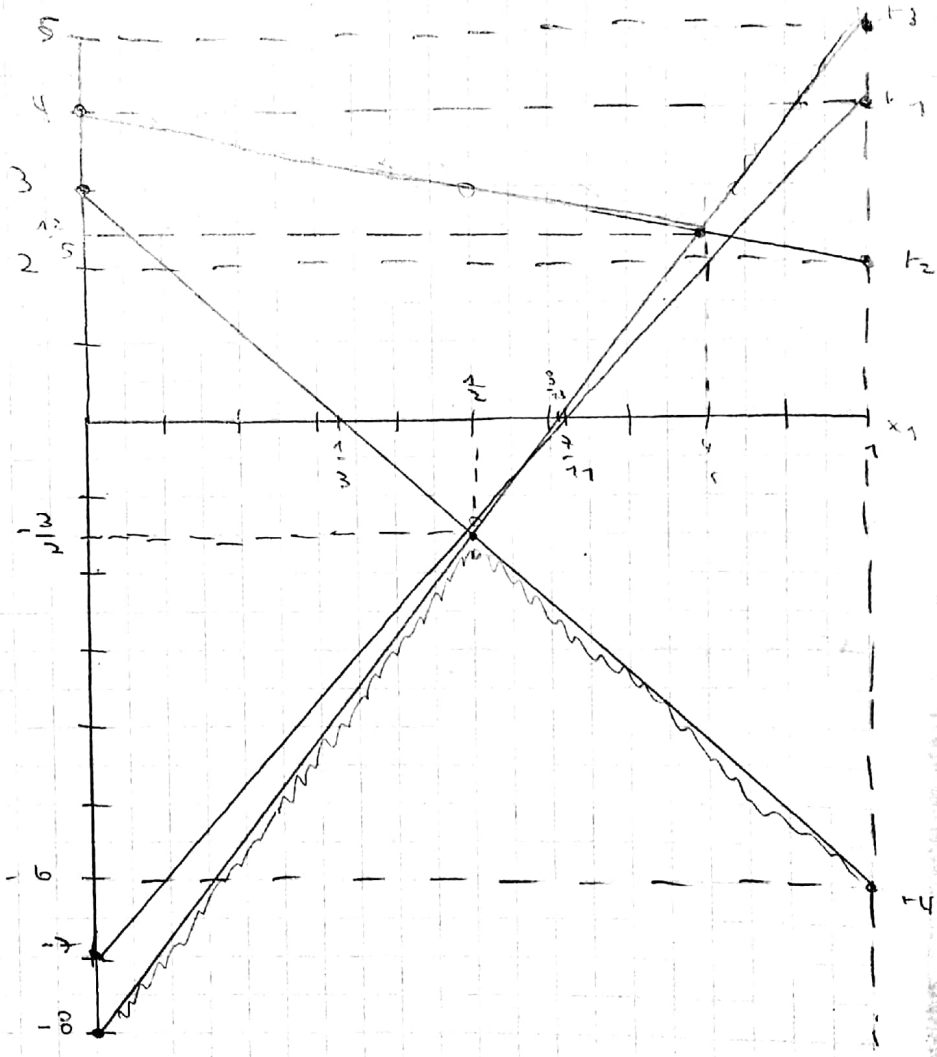
$22x_1 = 11$

$x_1 = \frac{1}{2}$

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

$x_2 = 1 - \frac{1}{2} = \frac{1}{2}$

$I\left(\frac{1}{2}; \frac{1}{2}\right)$



	y_3	y_4
x_1	5	-6
x_2	-8	3

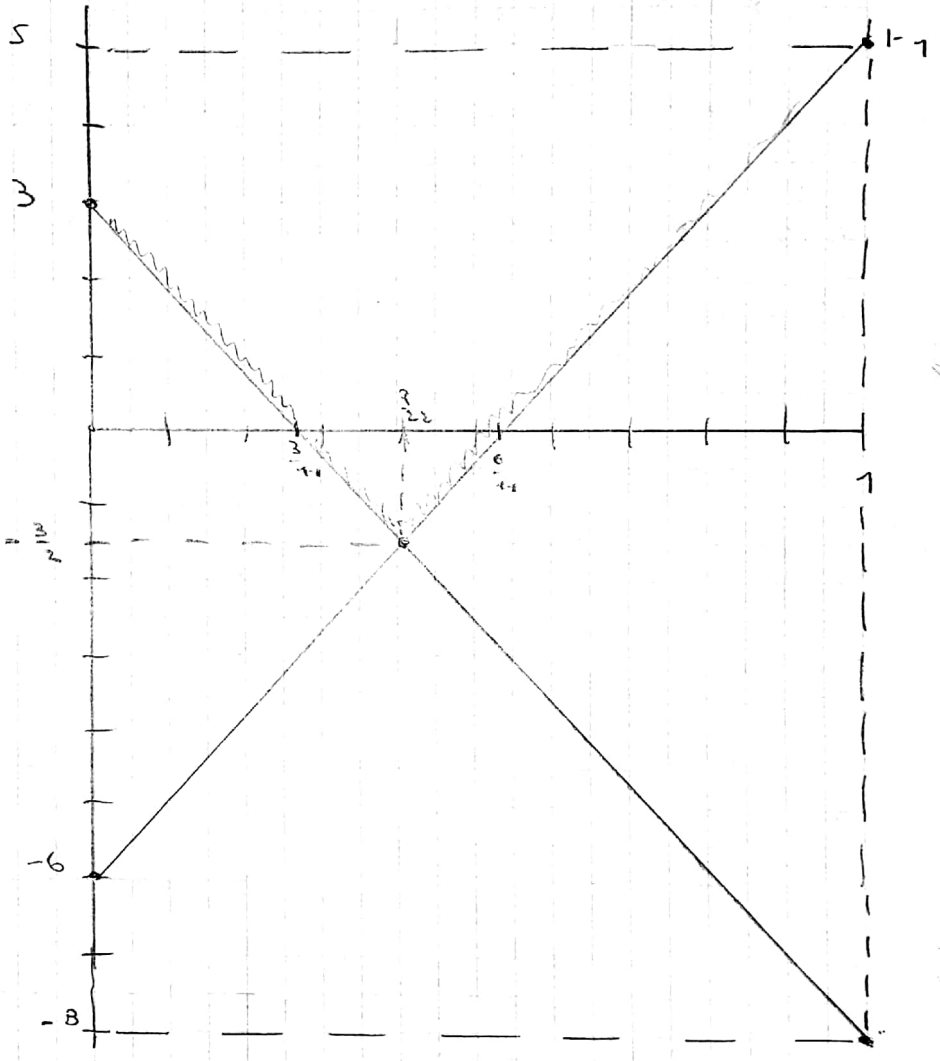
$f_1 \; \Sigma(II ; x_1) = 5y_3 - 6y_4 = 5y_3 + (-6).(1-y_3) = 11y_3 - 6$

$f_2 \; \Sigma(II ; x_2) = -8y_3 + 3y_4 = -8y_3 + 3.(1-y_3) = -11y_3 + 3$

Puntos gráfico

$f_1 \quad 11.0 - 6 = -6 \qquad 11.1 - 6 = 5$

$f_2 \quad -11.0 + 3 = 3 \qquad -11.1 + 3 = -8$



Punto intermedio

$f_1 \quad 0 = 11y_3 - 6$

$6 = 11y_3$

$\frac{6}{11} = y_3$

$f_2 \quad 0 = -11y_4 + 3$

$11y_3 = 3$

$y_3 = \frac{3}{11}$

Punto más bajo:

$f_1 \; \Sigma = 11y_3 - 6 = 11.\frac{9}{22} - 6 =$

$f_2 \; \Sigma = -11y_3 + 3$

$11y_3 - 6 = -11y_3 + 3$

$11y_3 + 11y_3 = 3 + 6$

$22y_3 = 9$

$y_3 = \frac{9}{22}$

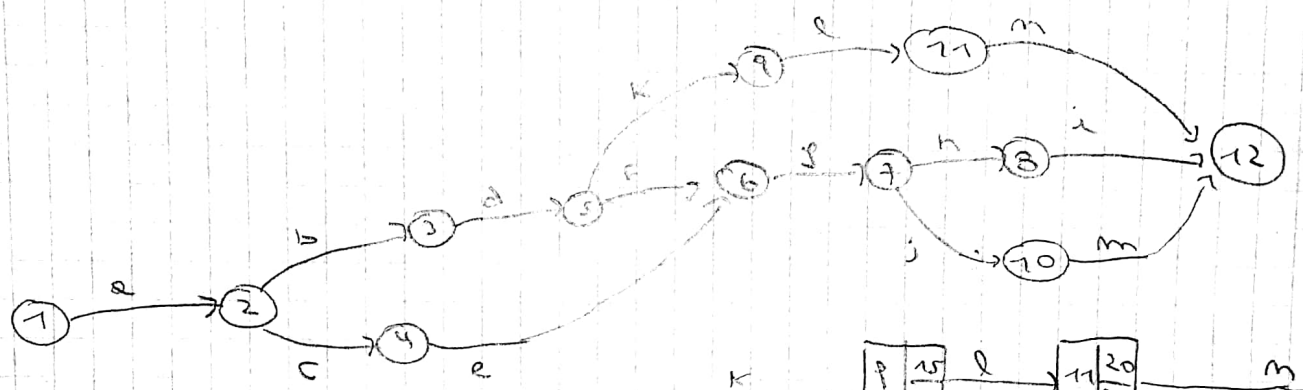
$y_4 = 1 - \frac{9}{22} = \frac{13}{22}$

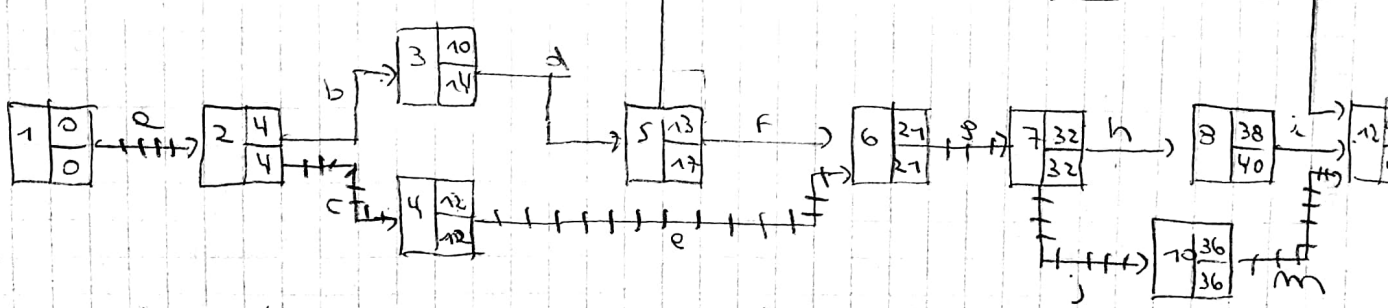
$V = -\frac{3}{2}$

$II\left(0, 0, \frac{9}{22}, \frac{13}{22}\right)$

3) Calcular el camino crítico y duración del proyecto

tarea	duración	Precedencia
a	4	-
b	6	a
c	8	a
d	3	b
e	9	c
f	4	d
g	11	e
h	6	f
i	5	g
j	4	g
k	2	a
l	5	k
m	9	l, i, j





tarea	duración	t_i	t_j	T_i	T_j	M_T
a	4	0	4	0	4	0
b	6	4	10	4	14	4
c	8	4	12	4	12	0
d	3	10	13	14	17	4
e	9	12	21	12	21	0
f	4	13	21	17	21	4
g	11	21	32	21	32	0
h	6	32	38	32	40	2
i	5	38	45	40	45	2
j	4	32	36	32	36	0
k	2	13	15	17	34	19
l	5	15	20	34	39	19
m	9	36	45	36	45	0
	6	20	45	39	45	19

a − c − e − g − j − m camino crítico