

ECE 307 HW #2

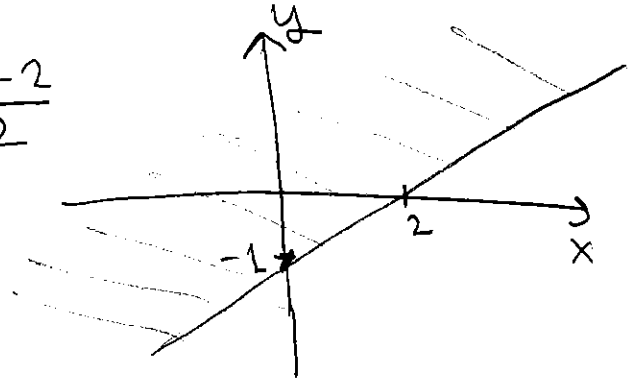
Solutions

①

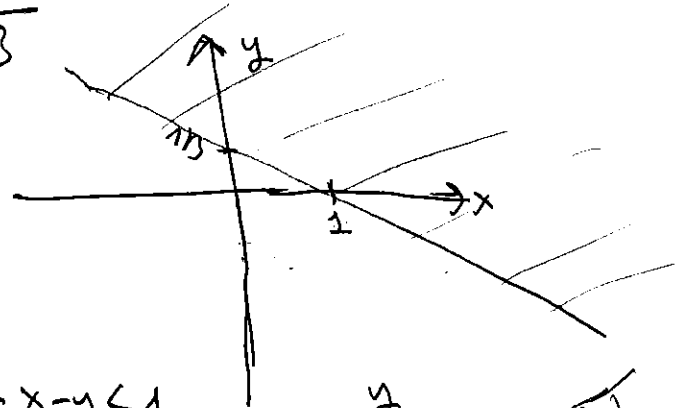
a) $x - 2y \leq 2 \rightarrow y \geq \frac{x-2}{2}$

$x=0 \rightarrow y=-1$

$y=0 \rightarrow x=2$



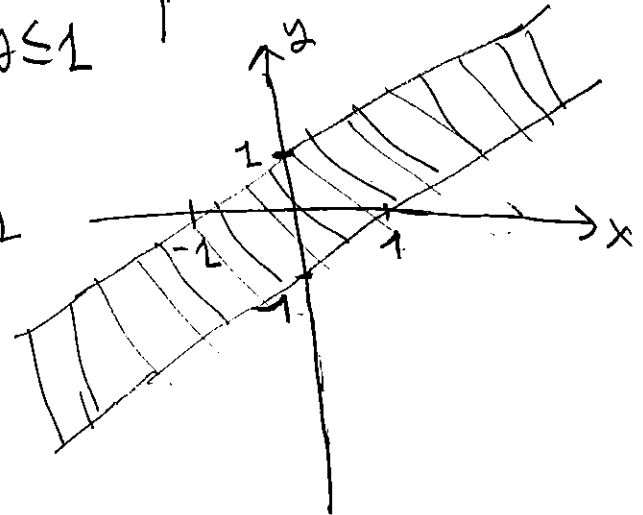
b) $x + 3y \geq 1 \rightarrow y \geq \frac{1-x}{3}$



c) $|x - y| \leq 1 \rightarrow -1 \leq x - y \leq 1$

$x - y \geq -1 \rightarrow y \leq x + 1$

$x - y \leq 1 \rightarrow y \geq x - 1$

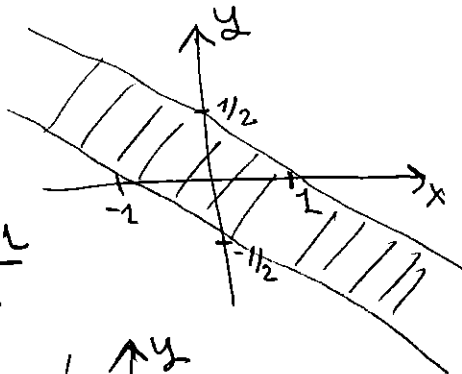


d) $|x + 2y| \leq 1$

$\rightarrow -1 \leq x + 2y \leq 1$

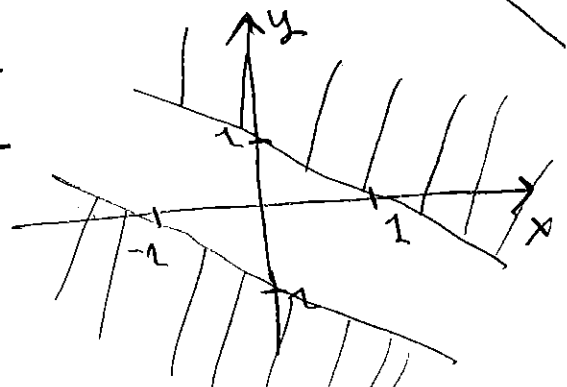
$x + 2y \leq 1 \rightarrow y \leq \frac{1-x}{2}$

$x + 2y \geq -1 \rightarrow y \geq \frac{-x-1}{2}$



e) $|x + y| \geq 1 \rightarrow x + y \geq 1$

$x + y \leq -1$



Q2 $S = \{1, 2, 3\}$

a) Events are

$\{1\}$	$\{1, 2\}$	$\{1, 2, 3\}$	$\{2\}$	$\{3\}$	$\{2, 3\}$	$\{1, 3\}$	\emptyset
\downarrow	\downarrow	\downarrow	\downarrow	\downarrow	\downarrow	\downarrow	\downarrow
A	B	C	D	E	F	G	H

b) $P(A) = \frac{N(A)}{N(S)} = 1/3$ $P(B) = 2/3$ $P(C) = 3/3$

$P(D) = 1/3$ $P(E) = 1/3$ $P(F) = 2/3$ $P(G) = 2/3$

$P(H) = 0$

Q3 $S = \{1, 2, 4\}$

The events that include "2" are

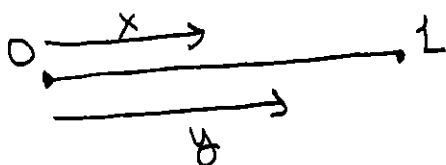
$A = \{1, 2\}$ $B = \{2, 4\}$ $C = \{1, 2, 4\}$ $D = \{2\}$

a) The events A, B, C, D did occur

b) $P(A) = 2/3$ $P(B) = 2/3$ $P(C) = 3/3$

$P(D) = 1/3$

Q4



$x \rightarrow$ first person's delay
 $y \rightarrow$ second person's delay

if $|x - y| < 20/60$ they meet

$|x - y| < 1/3 \rightarrow$ meeting event (A)

$-1/3 < x - y < 1/3$

$-1/3 < x - y \rightarrow y < x + 1/3$

$x - y < 1/3 \rightarrow y > x - 1/3$

