

Prelab 3

(a)

Comparator

Inputs	Output
$V_3 V_2 V_1 V_0$	Z
0 0 0 0	0
0 0 0 1	0
0 0 1 0	0
0 0 1 1	0
0 1 0 0	0
0 1 0 1	0
0 1 1 0	0
0 1 1 1	0
1 0 0 0	0
1 0 0 1	0
1 0 1 0	1
1 0 1 1	1
1 1 0 0	1
1 1 0 1	1
1 1 1 0	1
1 1 1 1	1

Circuit A

Inputs	Outputs
$V_2 V_1 V_0$	$Y_2 Y_1 Y_0$
0 1 0	0 0 0
0 1 1	0 0 1
1 0 0	0 1 0
1 0 1	0 1 1
1 1 0	1 0 0
1 1 1	1 0 1

Circuit B

Z	$X_0 X_1 X_2 X_3 X_4 X_5 X_6$
0	0 0 0 0 0 0 1
1	1 1 0 0 1 1 1

Circuit A

$$Y_2 \Rightarrow \frac{V_2 V_1 V_0}{110} \quad Y_1 \Rightarrow \frac{V_2 V_1 V_0}{100}$$

$$\frac{111}{11-} \quad \frac{10-}{V_2 V_1}$$

$$\frac{10-}{V_2 V_1}$$

$$Y_0 \Rightarrow \frac{V_2 V_1 V_0}{011}$$

$$\frac{101}{111}$$

$$\frac{111}{V_0}$$

(b)

$V_3 V_2$ Comparator $V_1 V_0$

$V_3 V_2$	$V_1 V_0$
00	00 01 11 10
01	00 01 11 10
11	00 01 11 10
10	00 01 11 10

$V_3 V_2 V_1 V_0$	$V_3 V_2 V_1 V_0$
1100	1011
1101	1010
1111	1111
1110	1110
11--	1--1
$V_3 V_2$	$V_3 V_1$

Comparator	General Equations
Circuit A	$V_3 V_2 + V_3 V_1$
Circuit B	$V_2 V_1 + V_2 V_0 + V_1 V_0$
	$Z = Z \bar{Z}$