

(a)

$x_1 x_0$	$y_1 y_0$	z_3	z_2	z_1	z_0
00	00	0	0	0	0
00	01	0	0	0	0
00	10	0	0	0	0
00	11	0	0	0	0
01	00	0	0	0	0
01	01	0	0	0	1
01	10	0	0	1	0
01	11	0	0	1	1
10	00	0	0	0	0
10	01	0	0	1	0
10	10	0	1	0	0
10	11	0	1	1	0
11	00	0	0	0	0
11	01	0	0	1	1
11	10	0	1	1	0
11	11	1	0	0	1

$$z_3 = x_1 x_0 y_1 y_0$$

$$z_0 = x_0 y_0$$

$$z_1 = y_1 \bar{x}_1 x_0 + y_1 \bar{y}_0 x_0 + \bar{y}_1 y_0 x_1 + y_0 \bar{x}_0 x_1$$

$$z_2 = \cancel{y_1 \bar{x}_1 x_0} y_1 x_1 x_0 + y_1 y_0 x_1$$

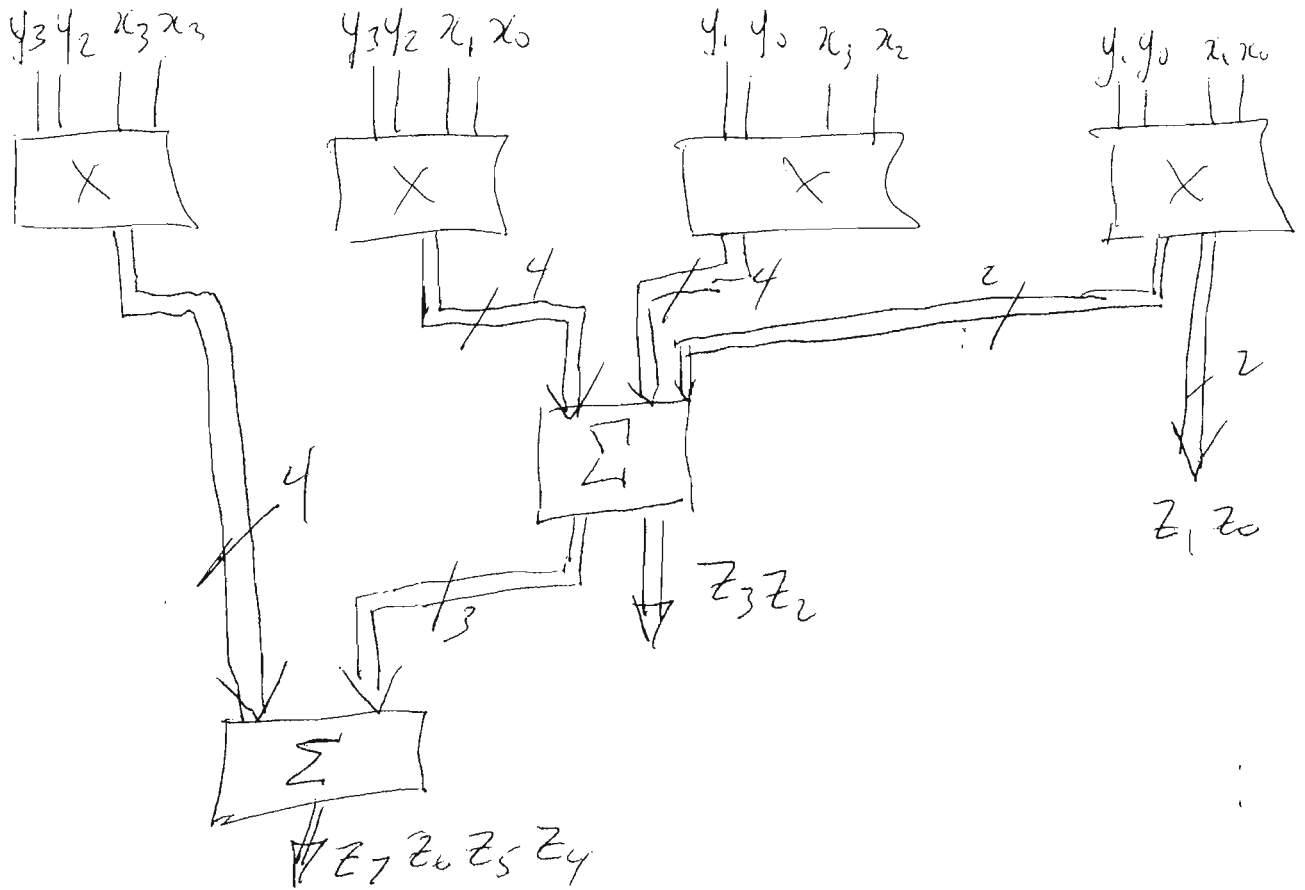
Truth table for z_0 :

x_1	x_0	y_1	y_0	z_0
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	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

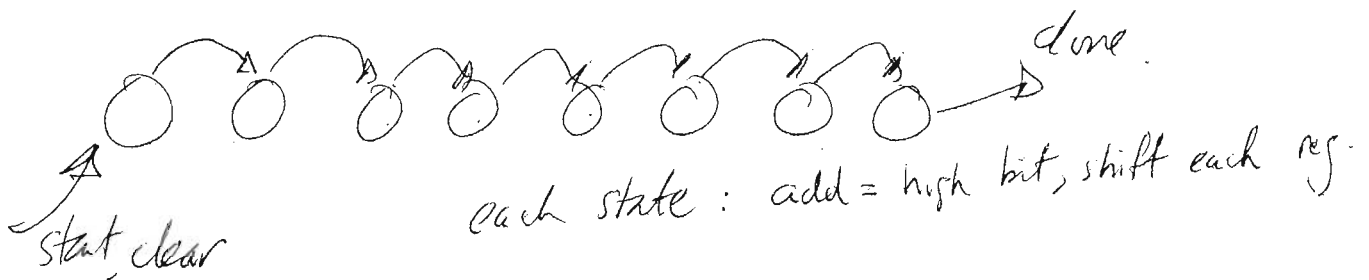
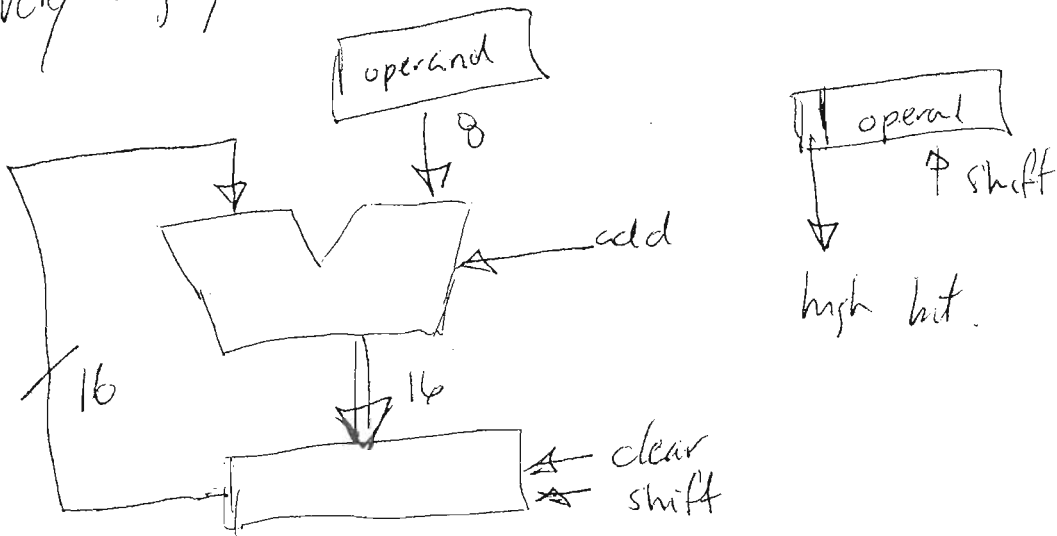
Truth table for z_1 :

x_1	x_0	y_1	y_0	z_1
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	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

b)



c) Very roughly:



d) Very much like c, but need comparator to decide if to subtract.