

$x$	$y$	$z$	$xyz$	$X(yz)'$	$X'(y+z)$	$(xyz)'$	$Xyz+x(yz)'$	$X'(y+z)+(xyz)'$	$Xyz+x(yz)'+x'(y+z)+(xyz)'$
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0	0	0				1		1	1
0	0	1			1	1		1	1
0	1	0			1	1		1	1
0	1	1			1	1		1	1
1	0	0		1		1		1	1
1	0	1		1		1		1	1
1	1	0		1		1		1	1
1	1	1	1				1		1

b. truth table for  $(x+y')(x'+z')(y'+z')$

x	y	z	$X+y'$	$X'+z'$	$Y'+z'$	$(x+y')(x'+z')$	$(x+y')(x'+z')(y'+z')$
0	0	0	1	1	1	1	1
0	0	1	1	1	1	1	1
0	1	0		1	1		
0	1	1		1			
1	0	0	1	1	1	1	1
1	0	1	1		1		
1	1	0	1	1	1	1	1
1	1	1	1				

6. Using De Morgan's law, write an expression for the complement of F (F') given:

$$\begin{aligned}
 F(x,y,z) &= xz'(xy+xz)+xy'(wz+y) \\
 F' &= (xz'(xy+xz))' (xy'(wz+y))' \\
 &= (xz')' + (xy+xz)' ((xy)' + (wz+y)') \\
 &= ((x'+z')) + ((xy)'(xz')) ((x'+y') + (wz')y') \\
 &= ((x'+z) + ((xy)'(xz))) ((x'+y) + (wz)y') \\
 &= ((x'+z) + ((x'+y)(x'+z))) ((x'+y) + (w'+z')y') \\
 &= ((x'+z) + (x'+y')(x'+z')) ((x'+y) + (w'+z')y')
 \end{aligned}$$

14a. Simplify using bool algebra and identities. List each identity as they are used.

$$F(x,y,z) = y(x' + (x+y)')$$

$$\text{De Morgan's} = y(x' + x'y')$$

$$\text{Absorptive} = yx'$$

23. The truth table for a bool expression is shown. Write a bool expression in SOP form

Even though we haven't been taught in class, I am going to use a Kmap to make this process quicker

~~XY~~ ~~AB~~

	00	01	11	10
0	1	1	1	
1	1	1		

*(Note: In the original image, a red circle groups the 1s in the first two columns, and a red circle groups the 1s in the first three rows.)*

In SOP form:  $x' + xyz'$

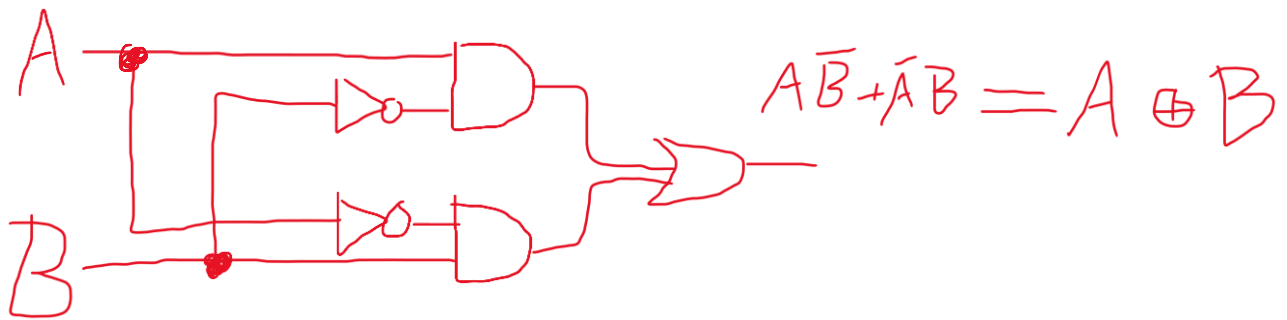
x	Y	z	F
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	0

26. Given the bool function  $f(x,y,z) = x'y + xyz'$

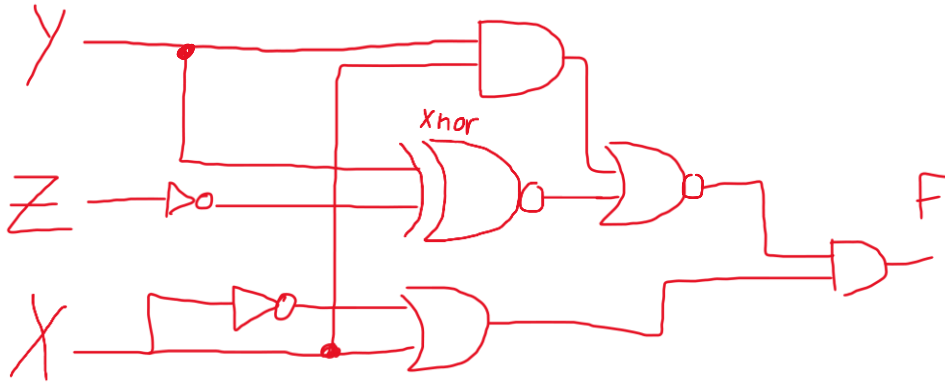
a. derive an algebraic expression for the complement of F in SOP form

De Morgan's:  $f = (x+y)'+(x'+y'+z)'$

40. Construct the XOR operator using only AND, OR, and NOT gates



49. Find the truth table for the following circuit:



x	y	z	xy	$Xx'$	$Y \text{ xnor } z'$	$XY \text{ nor } (y \text{ xnor } z')$	$(xy \text{ nor } (y \text{ xnor } z')) \text{ } xx'$
0	0	0		0	1	1	0
0	0	1		0			0
0	1	0		0			0
0	1	1		0	1	1	0
1	0	0		0	1	1	0
1	0	1		0			0
1	1	0		0			0
1	1	1	1	0	1		0

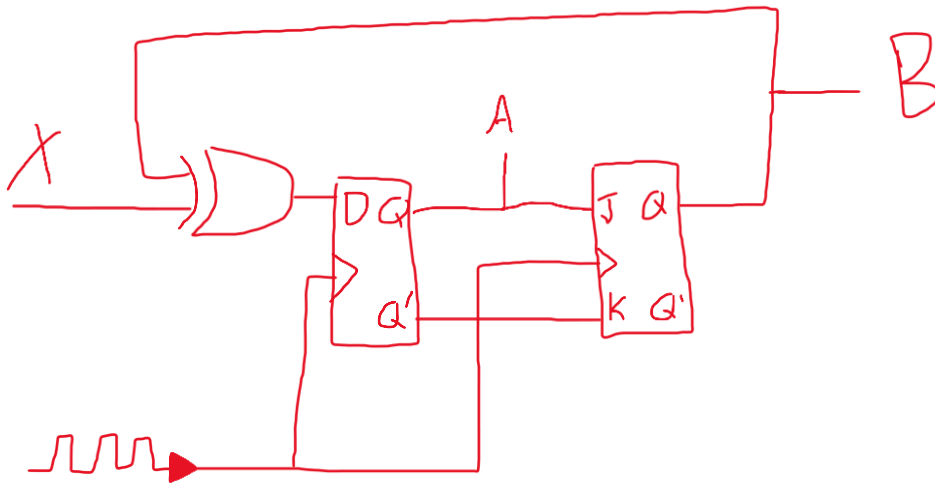
51. How many inputs does a decoder have if it has 64 outputs?

Basically asking 2 to what power = 64?

$$\log_2 64 = 6$$

Answer is 6

63. Complete the truth table for the following sequential circuit



A	B	X	Next A	Next B
0	0	0	0	0
0	0	1	1	1
0	1	0	1	1
0	1	1	0	0
1	0	0	0	0
1	0	1	1	1
1	1	0	1	1
1	1	1	0	0

