HW §8.3 #3, 9, 22

#3

	x_1x_2	x_1x_2'	$x_1'x_2'$	$x_1'x_2$
x_3	1	1	1	1
x_3'	1			1

$x_3 + x_1'x_2 + x_1x_2$

(which simplifies to $x_3 + x_2$)

But even better: Use a wrapped block of four.

#9

	x_1x_2	x_1x_2'	$x_1'x_2'$	$x_1'x_2$
x_3	1			1
x_3'	1			

$\underbrace{x_2x_3 + x_1x_2}_{\text{minimal sum of products,}}$

but $x_2\cdot(x_1+x_3)$ is simpler.

#22 I did a Karnaugh 1st, to get an idea of my target:

	x_1x_2	x_1x_2'	$x_1'x_2'$	$x_1'x_2$
x_3x_4	1	1		1
x_3x_4'		1		
$x_3'x_4'$				
$x_3'x_4$	1			1

Here's one with "four on the corners"!

$x_1x_2'x_3 +$

$x_2x_3x_4 +$

$x_2x_3'x_4 \rightarrow$

$\boxed{x_1x_2'x_3 + x_2x_4}$

Now on to Quine-McCluskey:

# of 1s	x_1	x_2	x_3	x_4	covered
4	1	1	1	1	1,2,3
3	1	1	0	1	1,4
	0	1	1	1	2,5
	1	0	1	1	3,6
2	1	0	1	0	6
	0	1	0	1	4,5

x_1	x_2	x_3	x_4	
1	1	-	1	1
-	1	1	1	1
1	-	1	1	1
-	1	0	1	1
0	1	-	1	1
1	0	1	-	

x_1	x_2	x_3	x_4
-	1	-	1

Done

	1111	1101	0111	1011	1010	0101	
-1-1	✓	✓	✓			✓	*
1-11	✓			✓			
101-				✓	✓		*

These two are essential

required to cover those two

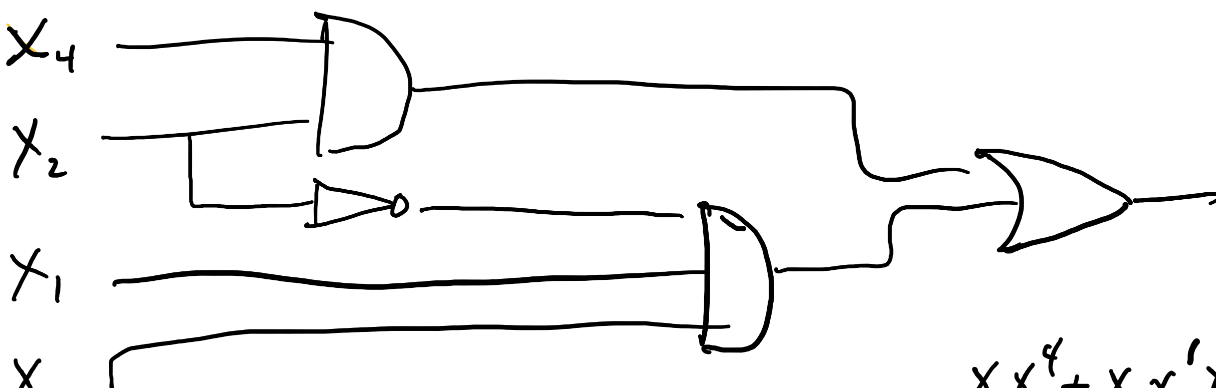
So this one isn't necessary!

$$f(x_1, x_2, x_3, x_4) = \boxed{x_2 x_4 + x_1 x_2' x_3}$$

as we suspected, based on Karnaugh.

Now you've got to admit that these are kind of fun....

well... maybe not <u>that</u> much fun! :-)



$x_2 x^4 + x_1 x_2' x_3$