Marcus Domingo
ECE-301-002 HW 3

2.20: $f(x_1, x_2, x_3) = \sum m(3,4,6,7) = \overline{x_1}x_2x_3 + x_1\overline{x_2x_3} + x_1x_2\overline{x_3} + x_1x_2x_3$

$= x_2x_3(\overline{x_1} + x_1) + x_1\overline{x_3}(\overline{x_2} + x_2)$

$= x_2x_3 + x_1\overline{x_3}$

2.23: $f(x_1, x_2, x_3) = \prod M(0,1,5,7)$

$= (x_1 + x_2 + x_3) \cdot (x_1 + x_2 + \overline{x_3}) \cdot (\overline{x_1} + x_2 + \overline{x_3}) \cdot (\overline{x_1} + \overline{x_2} + \overline{x_3})$

$= (x_1 + x_2 + x_3\overline{x_3}) \cdot (\overline{x_1} + x_2\overline{x_2} + \overline{x_3})$

$= (x_1 + x_2) \cdot (\overline{x_1} + \overline{x_3})$

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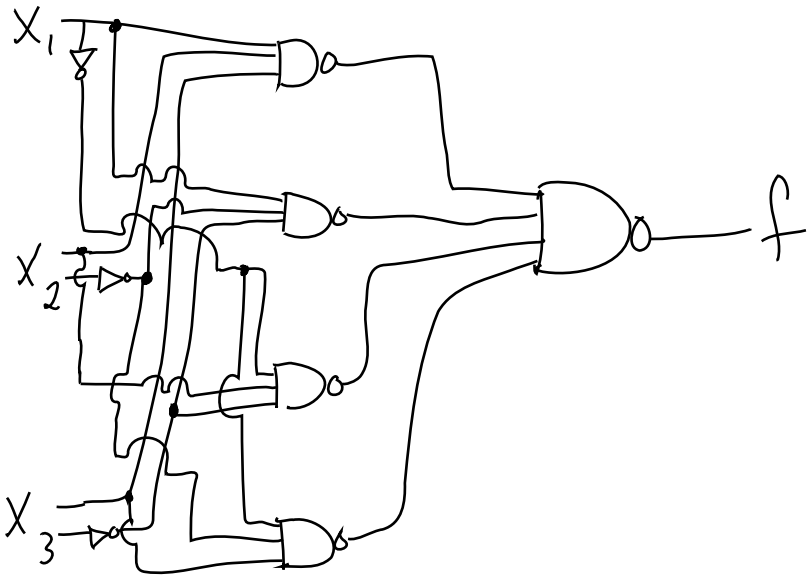
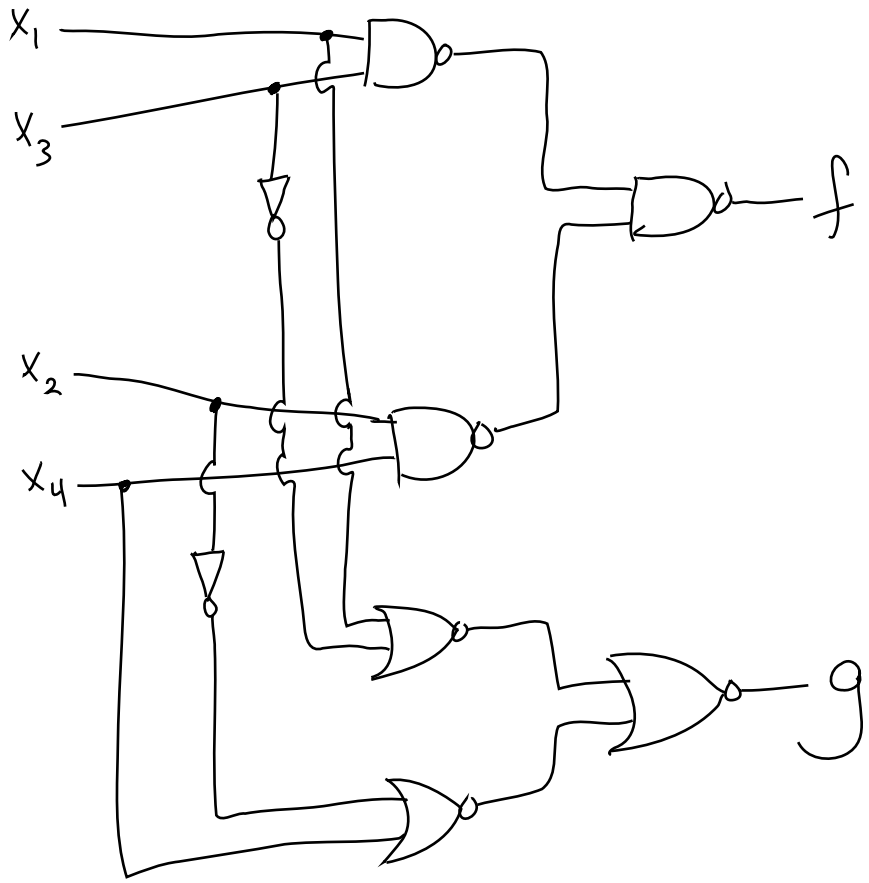
2.37: $f(x_1, x_2, x_4, x_7) = \sum m(1,2,4,7) = \overline{x_1 x_2} x_3 + \overline{x_1} x_2 \overline{x_3} + x_1 \overline{x_2 x_3} + x_1 x_2 x_3$



2.39:



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2.45: $f = \overline{x_1 x_2} x_3 + x_1 x_3 + x_2 x_3 + x_1 x_2 \overline{x_3}$

$= x_3(\overline{x_1 x_2} + x_1) + x_2(x_3 + x_1 \overline{x_3})$

$= x_3(\overline{x_2} + x_1) + x_2(x_3 + x_1)$

$= \overline{x_2} x_3 + x_1 x_3 + x_2 x_3 + x_1 x_2$

$= x_3(\overline{x_2} + x_2) + x_1 x_3 + x_1 x_2$

$= x_3 + x_1 x_3 + x_1 x_2 = x_3 + x_1 x_2$ (use $(x \cdot (x + y)) = x$)