Homework 5

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The algorithm will be defined as (stopping at the bottom case):

$B^f \odot B^g = (1 - x)(B^f|_{x=0} \odot B^g|_{x=0}) + x(B^f|_{x=1} \odot B^g|_{x=1})$
where $x = min(var(B^f), var(B^g))$

For the demonstration, we will assume that $\odot$ takes the lowest priority (sticks the least)

$f \odot g :$
$(1-x_1)(-x_2 \odot (\text{if } x_2 \text{ then } 4x_1 \text{ else } x_3+1)) + x_1(2x_2+1 \odot (\text{if } x_2 \text{ then } 4x_1 \text{ else } x_3+1)) =$
$(1-x_1)((1-x_2)(-0 \odot x_3 + 1) + x_2(-1 \odot 0)) + x_1((1-x_2)(1 \odot x_3 + 1) + x_2(3 \odot 4)) =$
$(1-x_1)((1-x_2)((1-x_3)(0 \odot 1) + x_3(0 \odot 2)) + x_2(-1 \odot 0)) + x_1((1-x_2)((1-x_3)(1 \odot 1) +$
$x_3(1 \odot 2)) + x_2(3 \odot 4))$

Written as MTBDD:

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