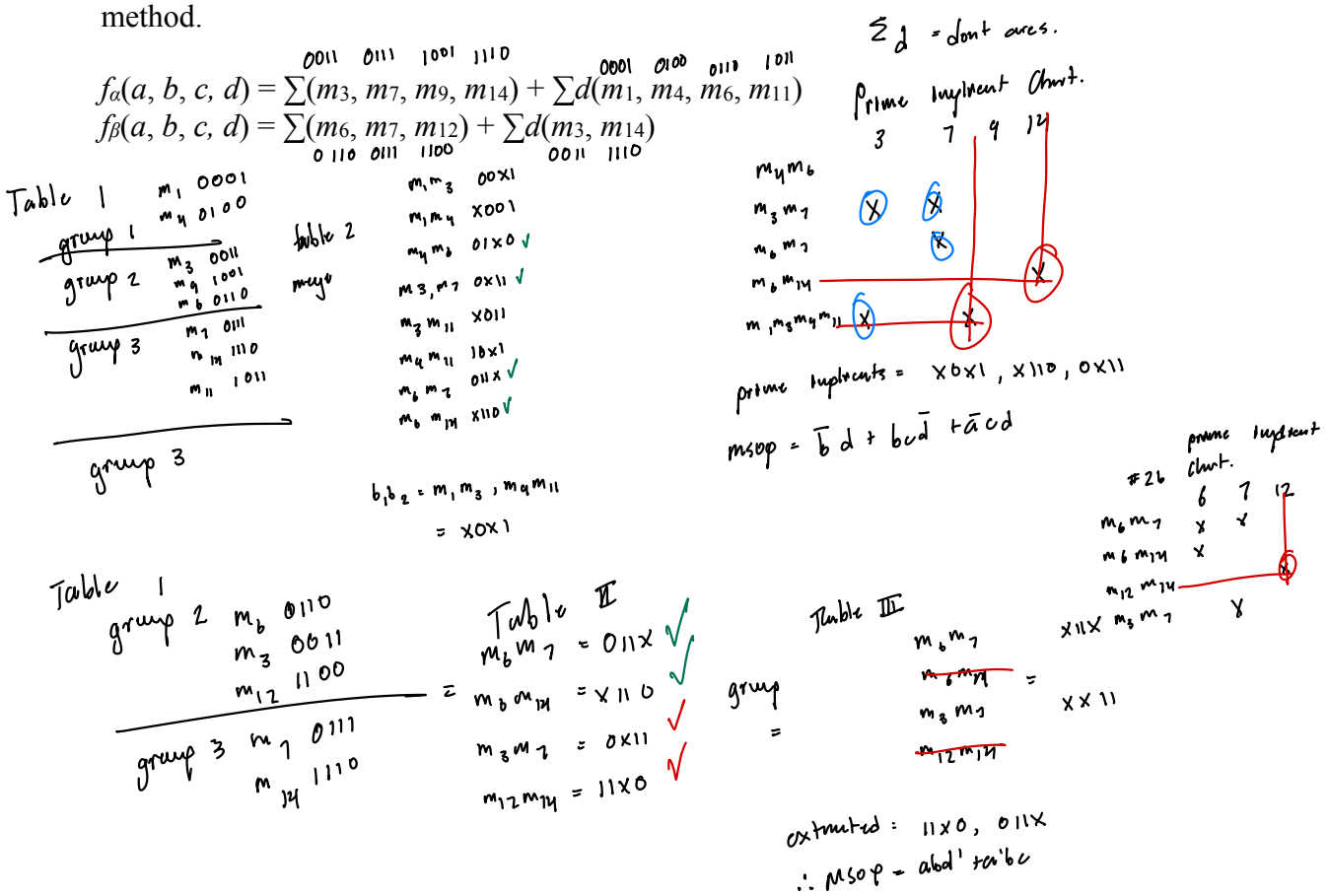
2. Consider the following multi-output functions and minimize them using the Quine-McCluskey method.

$f_\alpha(a, b, c, d) = \sum(m_3, m_7, m_9, m_{14}) + \sum d(m_1, m_4, m_6, m_{11})$

$f_\beta(a, b, c, d) = \sum(m_6, m_7, m_{12}) + \sum d(m_3, m_{14})$



3. **Design a 3-bit adder using a single carry-lookahead circuit** (one 3-bit carry-lookahead group). and provide a schematic

   (a) **Show all key logical expressions** (HINT: see example for 4-bit carry-lookahead).