

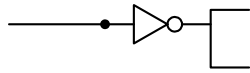
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Question 2

Digital Question { dead simple stuff.

(a) Simplify the following to a minimum number of gates:



Obviously, for infinite β , the current feeding into both bases is neglected. Hence $R = (5 - 0.7) / 1\text{mA} = 4.3\text{k}$

For $\beta = 100$, however, a full analysis needs doing. Assuming that the base drives are the same (matched). We now get $2i_B$ through R as well. Hence $I_o = 1\text{mA}$; $i_B = 10^{-5}\text{A}$; $I_{ref} = 1.02\text{mA}$; $R = (5$