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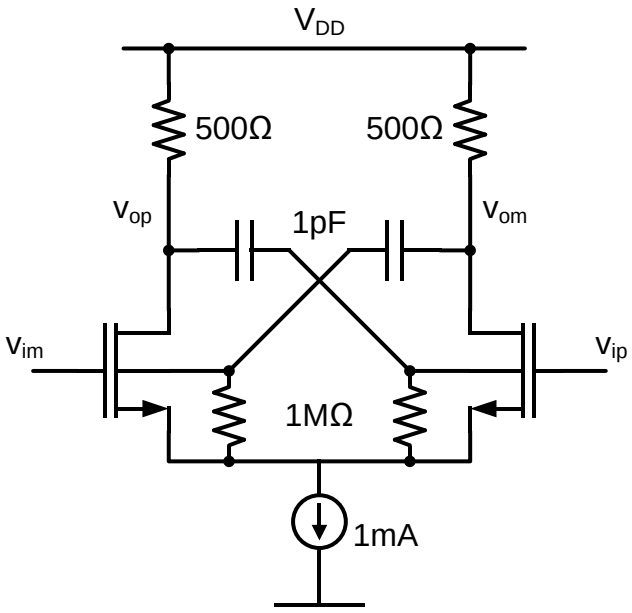
In the circuit below, all MOSFETs obey the ideal square law equations. The transistors are sized such that $|V_{GS}-V_t| = 200$ mV. The backgate transconductance is $g_{mb} = 0.2\ g_m$. Ignore all device capacitances.



1. Sketch the frequency response (magnitude only) of the differential small-signal voltage gain $(v_{op}-v_{om})/(v_{ip}-v_{im})$.

2. Is this circuit stable? Discuss in terms of gain and phase margin, as applicable.

3. Can this circuit work with the 1-pF decoupling capacitors shorted? Discuss potential issues.