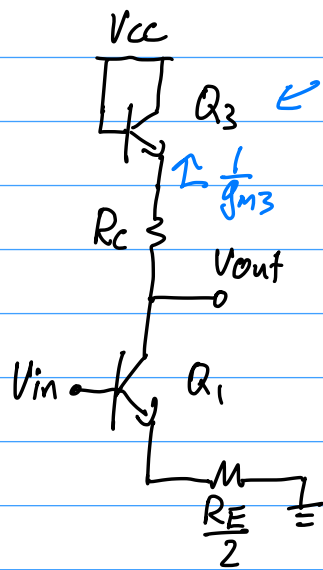


Draw the half circuit.



← This is a diode connected device (not a current source!)

(a) This is a degenerated CE.

$$A_v = -\frac{(R_c + \frac{1}{g_{m3}})}{\frac{1}{g_{m1}} + \frac{R_E}{2}}$$

(b) Notice $g_{m1} \approx g_{m3}$ (because they carry nearly identical currents).

\therefore Numerator and denominator will be equal if $R_c = \frac{R_E}{2}$.

Then $A_v = -1$ independently of g_m .