A BJT amplifier is shown. Assume that the BJT has the small signal parameters of $\beta_F = 100$, $V_t = 25\text{mV}$, and $V_A = \infty$.

a.) Find the midband voltage gain of this amplifier, $V_{out}/V_{in}$.

b.) Find the value of the lower -3dB frequency, $f_L$, in Hz, using any method that is appropriate.