1. Determine the value of the base current in the circuit below. Beta = 160.

\[-4 + IB \cdot R_{th} + 0.7 + IB(1+B)R_e = 0\]

\[IB = \frac{3.3}{(11.25k + 161*5k)}\]

2. Determine the Thevenin equivalent, Vth and Rth, for the circuit below.

\[V_{th} = \frac{5k}{20k} \times 20V = 5V\]

\[R_{th} = \frac{15k}{5k}\]
3. Determine a transistor’s $\beta_{ac}$ at $V_{ce} = 5V$ and $I_c = 15mA$ using the collector characteristics below.

![Collector Characteristics Graph]

4. Determine the collector-emitter voltage, $V_{ce}$, in the circuit below. The collector current is 10mA and $\beta = 20$.

![Circuit Diagram]

whoops