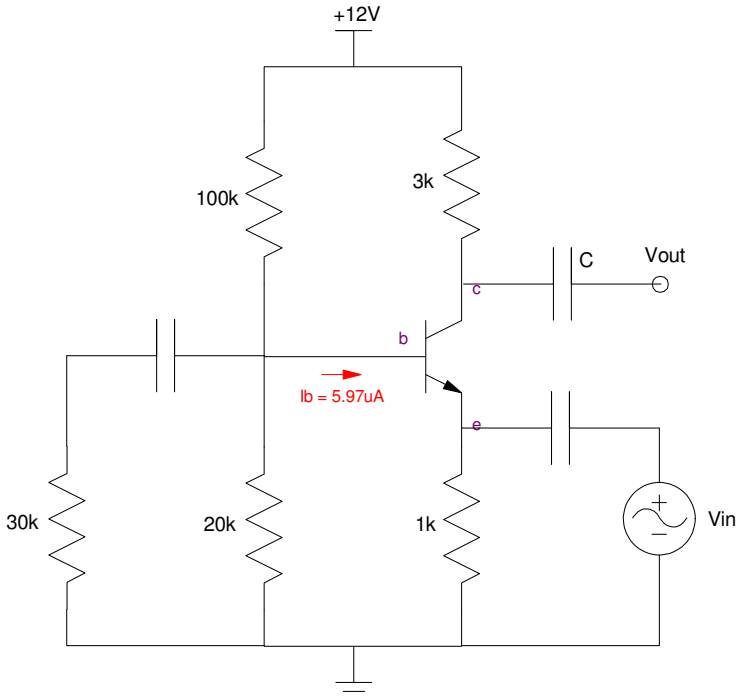
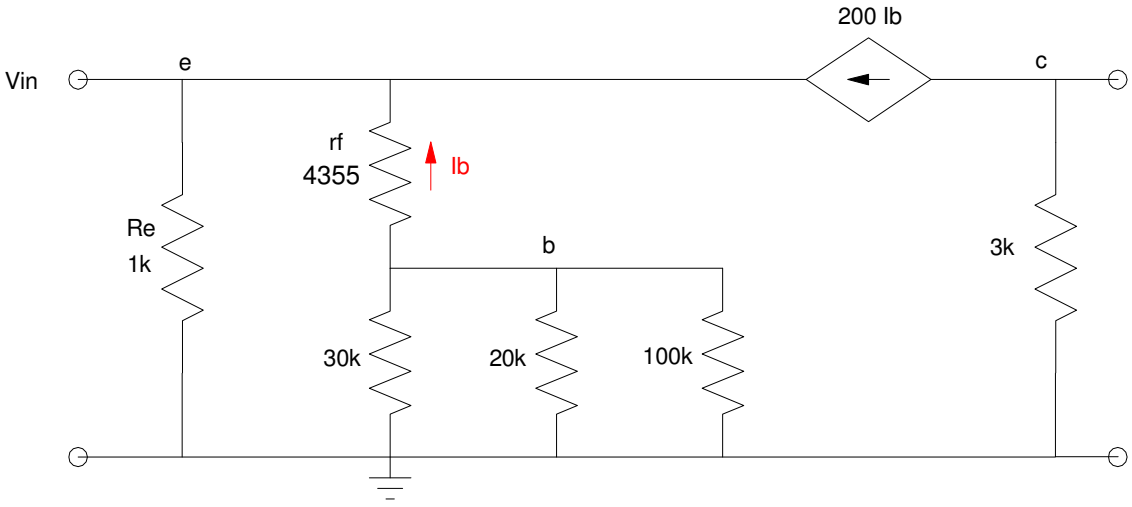
Solution



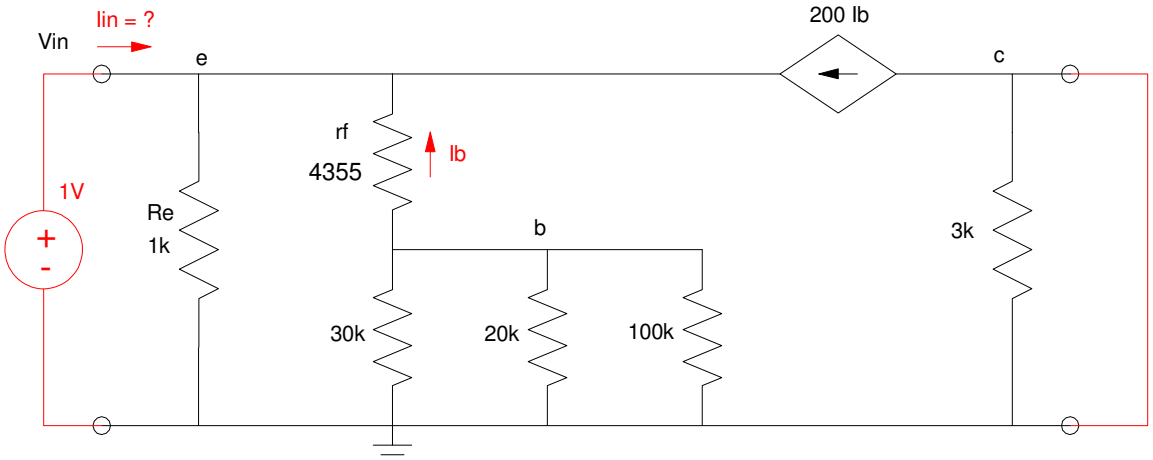
First, redraw the circuit



Now find the two-port parameters

Rin:

- Sort Vout
- Apply 1V at Vin and compute Iin



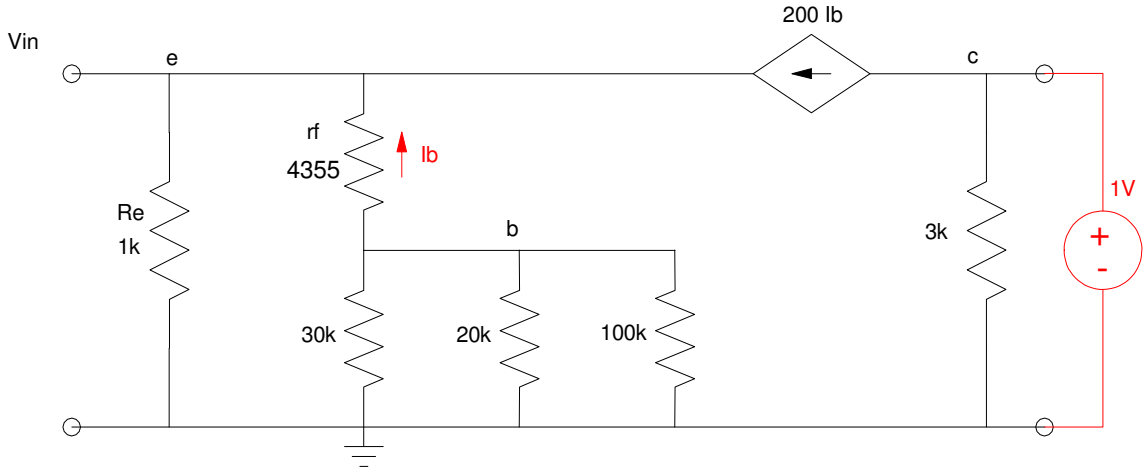
$$I_{in} = \frac{1V}{1k} + \frac{1V}{4355+30k||20k||100k} + 200\left(\frac{1V}{4355+30k||20k||100k}\right)$$

$$I_{in} = 14.34mA$$

$$R_{in} = \frac{1V}{14.34mA} = 69.74\Omega$$

Ai: Set Vo = 1V, compute Vin

- Vin = 0
- Ai = 0



Rout:

- Short Vin.
- Apply 1V at Vout and
- Computer Iin

Ib = 0

$$I = \frac{1V}{3k} = 333\mu A$$

$$R_{out} = \frac{1V}{333\mu A} = 3k$$