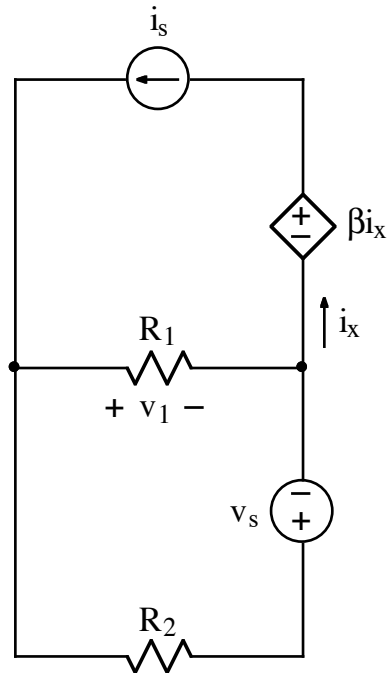
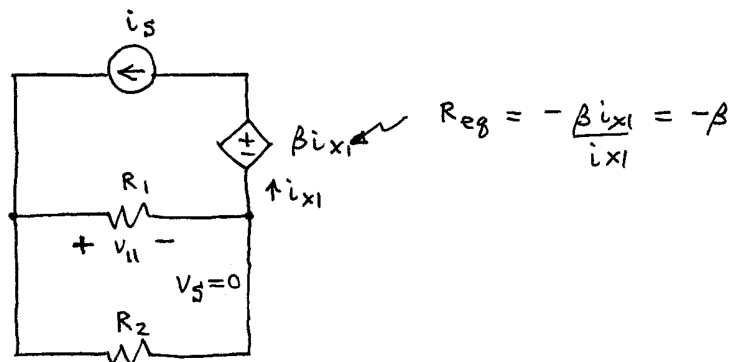


EX:



Using superposition, derive an expression for v_1 that contains no circuit quantities other than i_s , v_s , R_1 , R_2 , and β , where $\beta > 0$.

Sol'n: case I: i_s on, v_s off

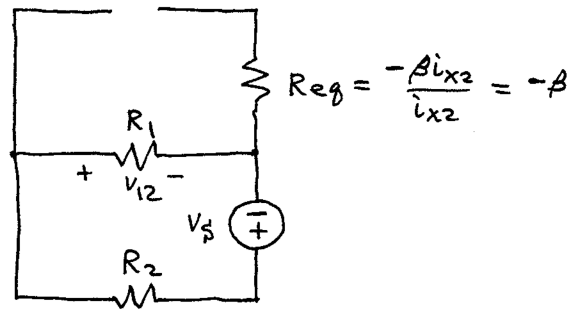


We have a current divider with R_1 & R_2 .

$$i_{R1} = i_s \cdot \frac{R_2}{R_1 + R_2}$$

$$v_{11} = i_{R1} \cdot R_1 = i_s \cdot R_1 \parallel R_2$$

case II: i_s off, v_s on



We have voltage divider.

$$v_{12} = v_s \cdot \frac{R_1}{R_1 + R_2}$$

Sum v_i 's:

$$v_1 = v_{11} + v_{12} = i_s \cdot R_1 \parallel R_2 + v_s \frac{R_1}{R_1 + R_2}$$