The BJT Diff Amp with Resistive Tail Supply
Differential and Common-Mode Analyses

\[ v_{o1} \]
\[ v_{o2} \]
\[ v_{i1} \]
\[ v_{i2} \]
\[ R_C \]
\[ R_B \]
\[ R_E \]
\[ R_Q \]

\[ r_{out, d} \] \[ R_C \]
\[ v_{o1, d} \]
\[ v_{id} \]
\[ R_B \]
\[ r_{in, d} \]
\[ R_E \]

\[ r_{out, cm} \] \[ R_C \]
\[ v_{o1, cm} \]
\[ v_{icm} \]
\[ 2R_Q \]
\[ 2R_Q \]

\[ r_{in, d} \] \[ 2R_Q \]

\[ r_{out, d} \] \[ R_C \]
\[ v_{o1, d} \]
\[ v_{id} \]
\[ i_{c1, d(sc)} \]
\[ r_{ic1, d} \]

\[ r_{out, cm} \] \[ R_C \]
\[ v_{o1, cm} \]
\[ v_{icm} \]
\[ 2R_Q \]
\[ 2R_Q \]

\[ r_{in, cm} \] \[ 2R_Q \]
\[ i_{c1, cm(sc)} \]
\[ r_{ic1, cm} \]