Exercices #4

6.28 For the circuits in Fig. P6.28, assume that the transistors have very large β. Some measurements have been made on these circuits, with the results indicated in the figure. Find the values of the other labeled voltages and currents.

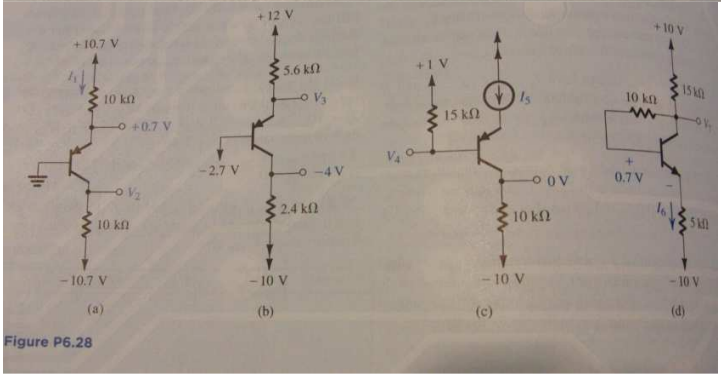


Figure P6.28

Quand on dit que le b est grand, ca veut simplement dire qu'il n'y a pas de courant qui entre dans la base. Donc, $I_E=I_C$.

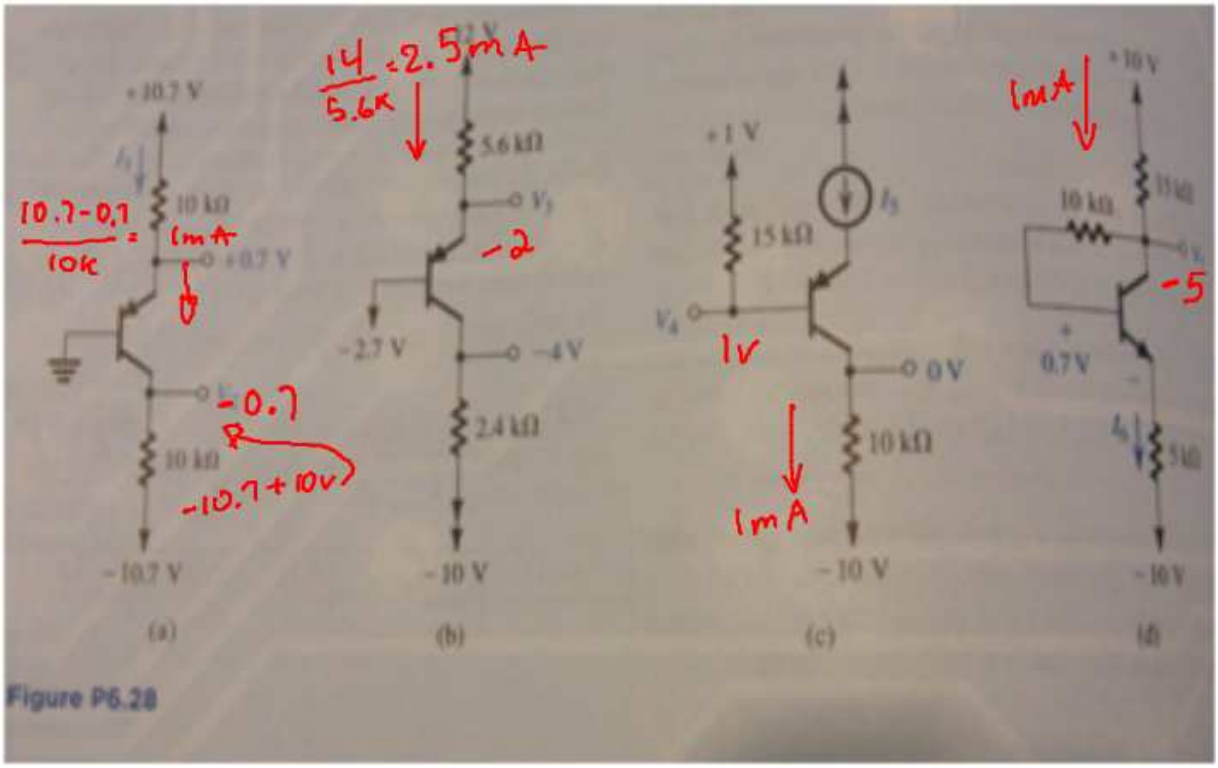


Figure P6.28

6.29 Measurements on the circuits of Fig. P6.29 produce labeled voltages as indicated. Find the value of β for each transistor.

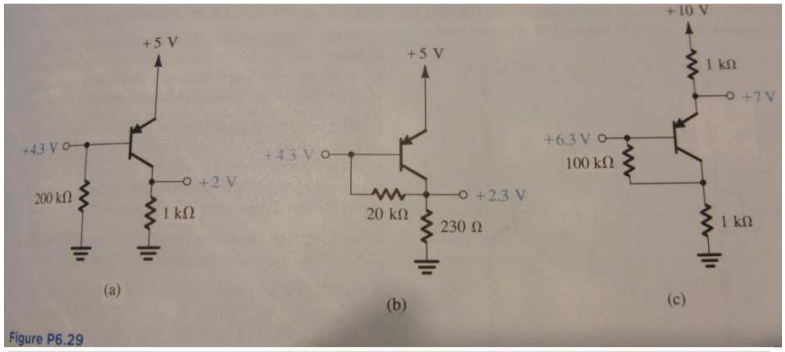


Figure P6.29

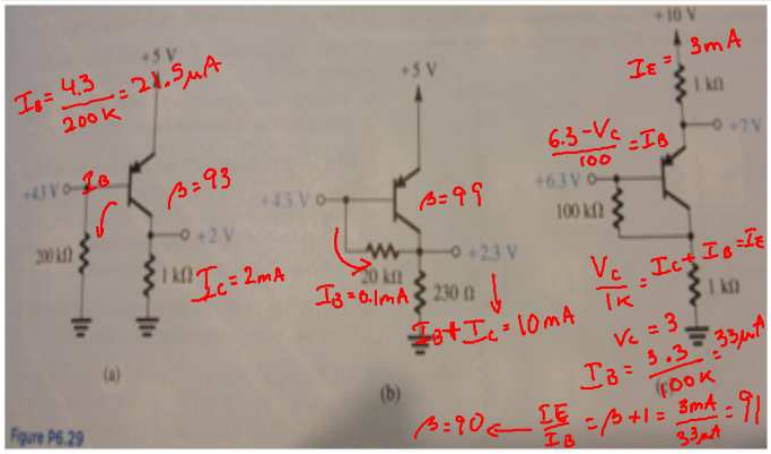


Figure P6.29

6.35 For each of the circuits shown in Fig. P6.35, find the emitter, base, and collector voltages and currents. Use $\beta = 50$, but assume $|V_{BE}| = 0.8$ V independent of current level.

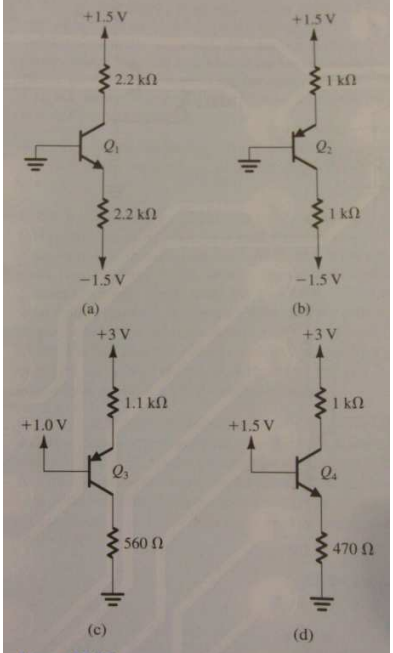
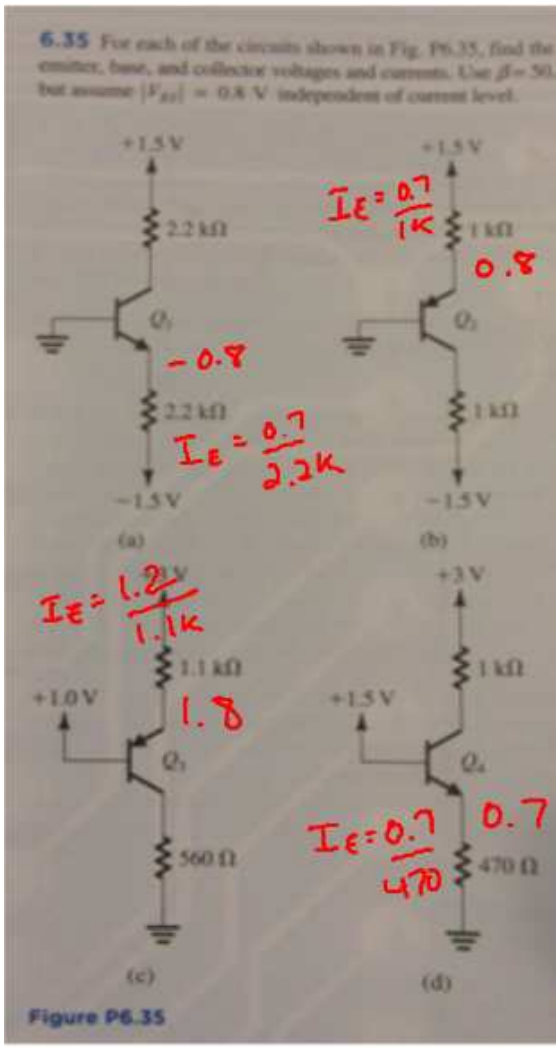


Figure P6.35



a)
ie=318μA
ic=β/(β+1)ie=312μA
vc=vcc-ic*rc=0.814

b)
ie=0.7mA
ic=686μA
vc=-0.814
c)
ie=1.09mA
ic=1.07mA
vc=0.61

d)
ie=1.49mA
ic=1.46mA
vc=1.54

6.62 For the circuits in Fig. P6.62, find values for the labeled node voltages and branch currents. Assume β to be very high.

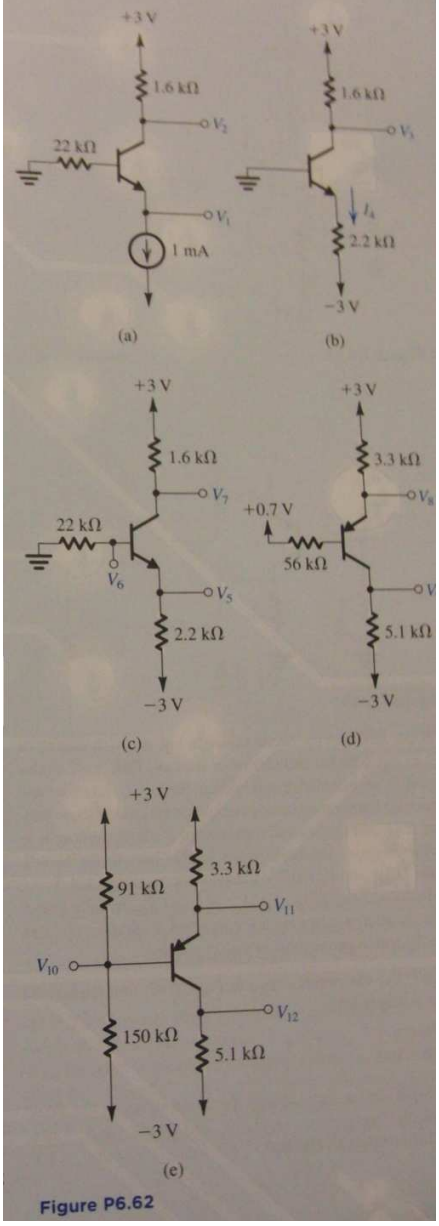


Figure P6.62

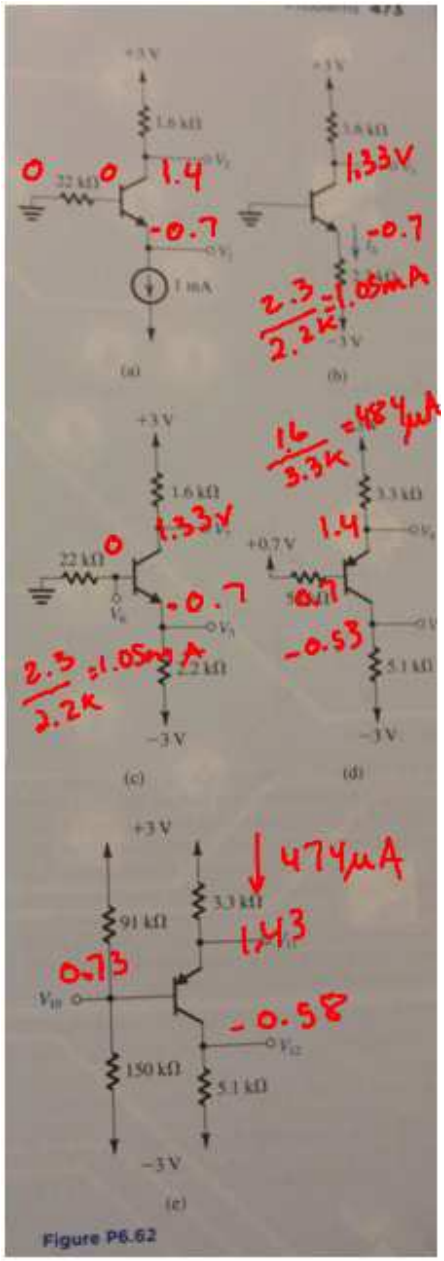
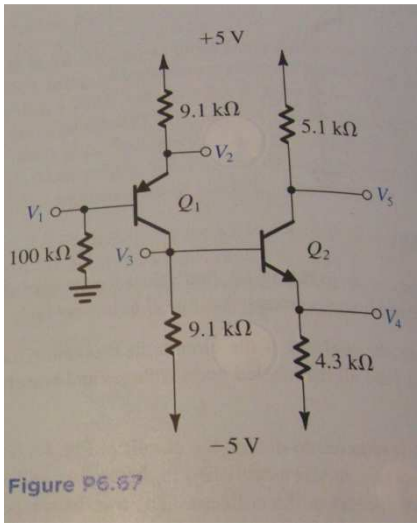


Figure P6.62

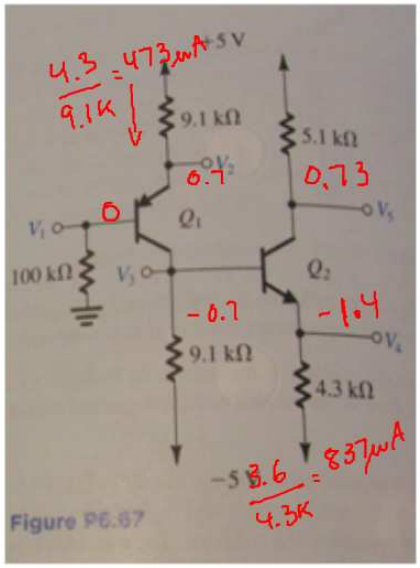
*6.67 For the circuit shown in Fig. P6.67, find the labeled node voltages for:

(a) $\beta = \infty$

(b) $\beta = 100$



β infini



β=100

Transistor Q1:

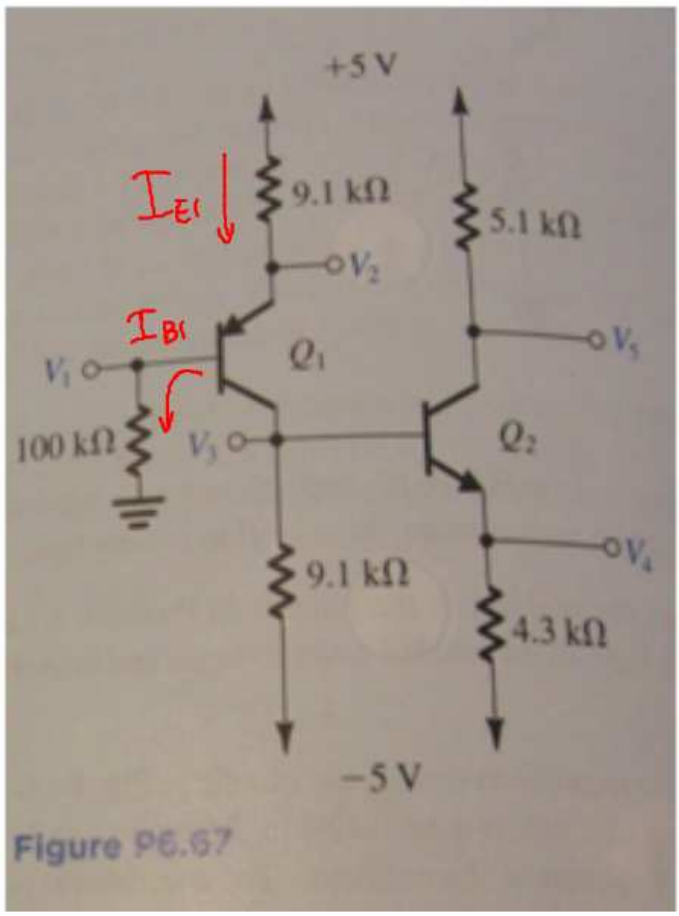


Figure P6.67

$V_{B1} = I_{B1} \cdot 100K$

$I_{E1} = (\beta+1) I_{B1} = \frac{5 - (V_{B1} + 0.7)}{9100}$

$(\beta+1) I_{B1} = \frac{5 - (I_{B1} \cdot 100K + 0.7)}{9100}$

$I_{B1} = 4.2\mu A$

$I_{E1} = 426\mu A$

$V_2 = 5 - 9100 \cdot I_{E1}$

$= 1.12V$

$V_1 = 0.42V$

$I_{C1} = 420\mu A$

Transistor Q2:

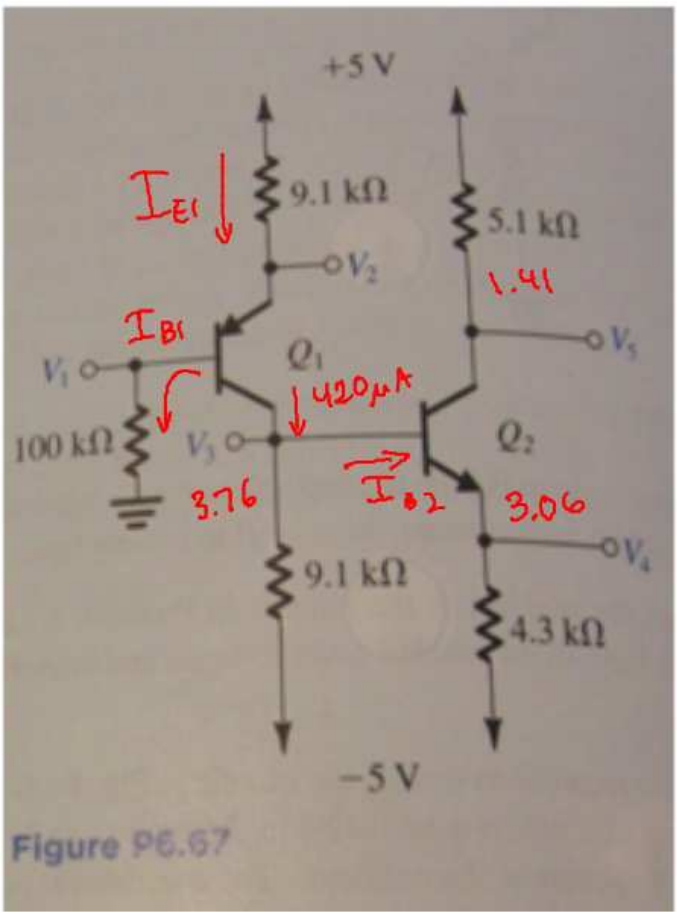


Figure P6.67

$I_{C1} = 420\mu A$

$I_{C1} = \frac{V_{B2}}{9.1K} + I_{B2}$

$I_{E2} = \frac{V_{B2} - 0.7}{4.3K} = (\beta+1) I_{B2}$

$I_{B2} = 7.04\mu A$

$V_{B2} = 3.76v$

$V_{E2} = 3.06v$

$V_{c2} = 5 - I_{c2} \cdot 5100$

$= 5 - 704\mu A \cdot 5100$

$= 1.41$