Choosing practical values:

- $R_1 = R_2 = 422\ \Omega$
- $R_8 = 26.1\ \Omega$

Proof

① $5 - I_C R_8 - V_D - 2V_{CE} = 0$

② $I_{B1} \cdot R_1 = 4.2$

③ $I_{B2} \cdot R_2 = 4.5$

For 2

$I_{B1}(422) = 4.2 \longrightarrow \underline{I_{B1} = 0.010\ A}$

$I_{E1} = I_C + I_{B1} = I_C + 0.01$

For 3

$I_{B2}(422) = 4.5 \longrightarrow \underline{I_{B2} = 0.011\ A}$

$I_C + 0.01 = 10(0.011) \longrightarrow \underline{I_C = 0.1\ A}$

For 1

$5 - (0.1)(26.1) - V_D - 2(0.3) = 0$

$5 - 2.61 - V_D - 0.6 = 0 \longrightarrow \underline{V_D = 1.79\ V}$

Just shy of maximum values. ✓