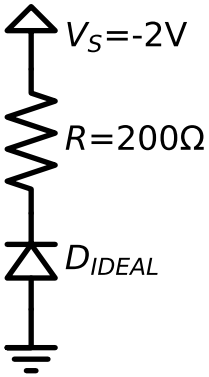
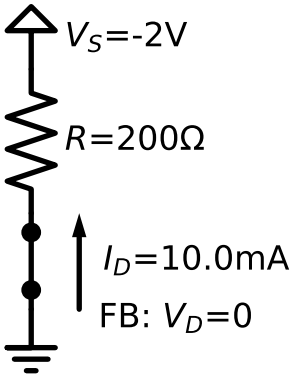
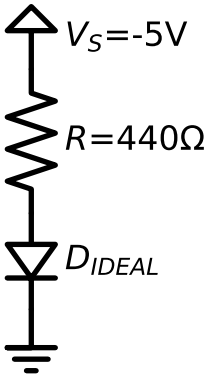
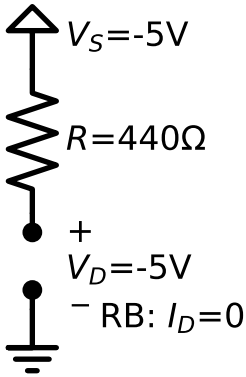

V_S=-2V
R=200Ω
D_{IDEAL}

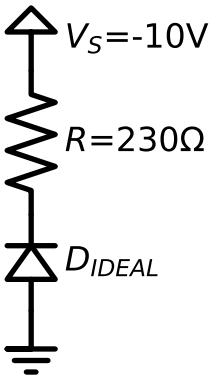

V_S=-2V
R=200Ω
I_D=10.0mA
FB: V_D=0

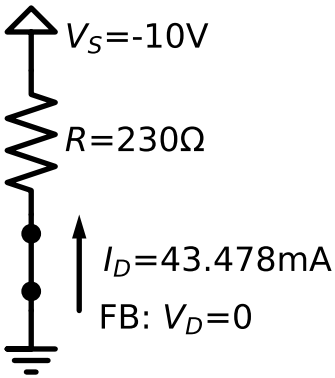
(a)


V_S=-5V
R=440Ω
D_{IDEAL}

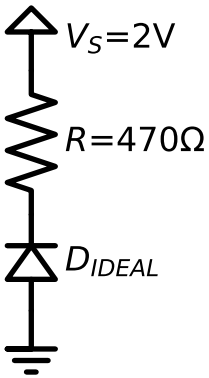

V_S=-5V
R=440Ω
+
V_D=-5V
− RB: I_D=0

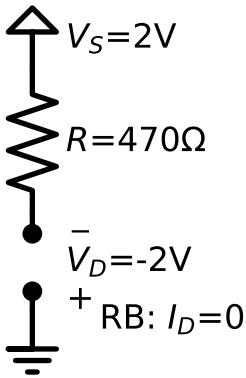
(b)


V_S=-10V
R=230Ω
D_{IDEAL}

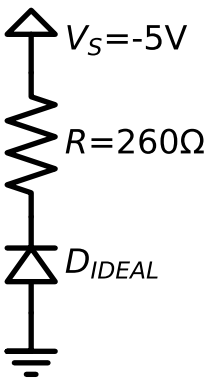

V_S=-10V
R=230Ω
I_D=43.478mA
FB: V_D=0

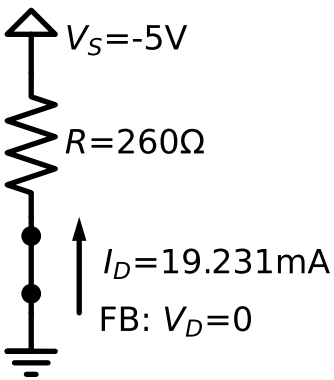
(c)


V_S=2V
R=470Ω
D_{IDEAL}

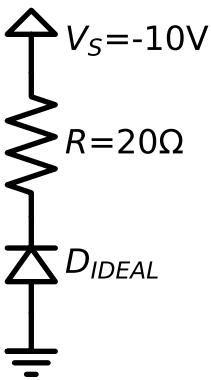

V_S=2V
R=470Ω
−
V_D=-2V
+ RB: I_D=0

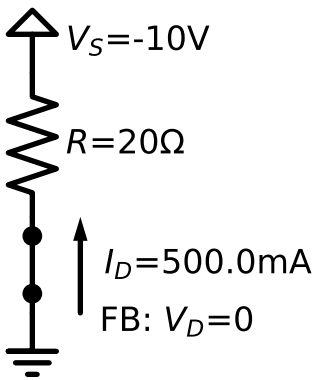
(d)


V_S=-5V
R=260Ω
D_{IDEAL}

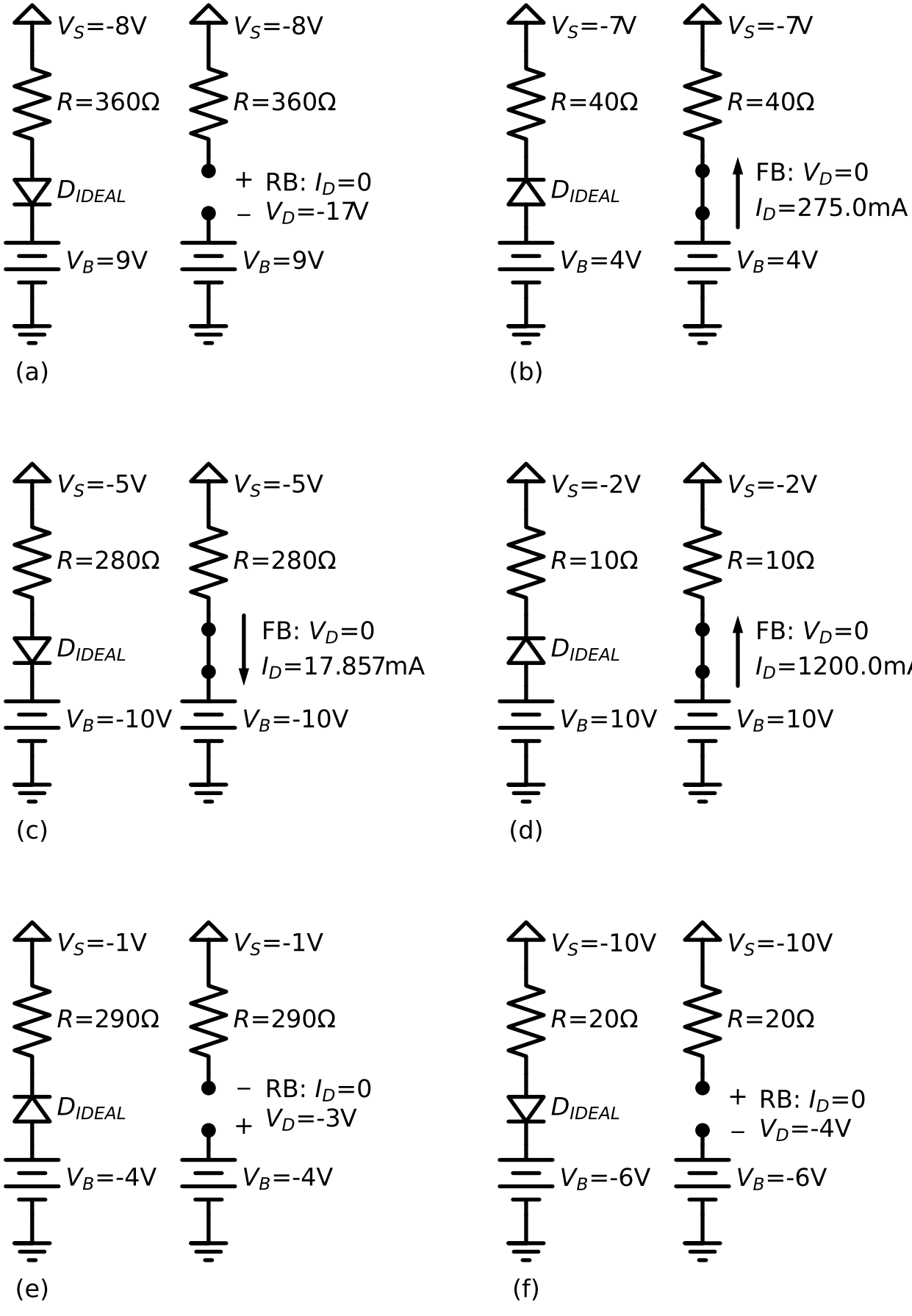

V_S=-5V
R=260Ω
I_D=19.231mA
FB: V_D=0

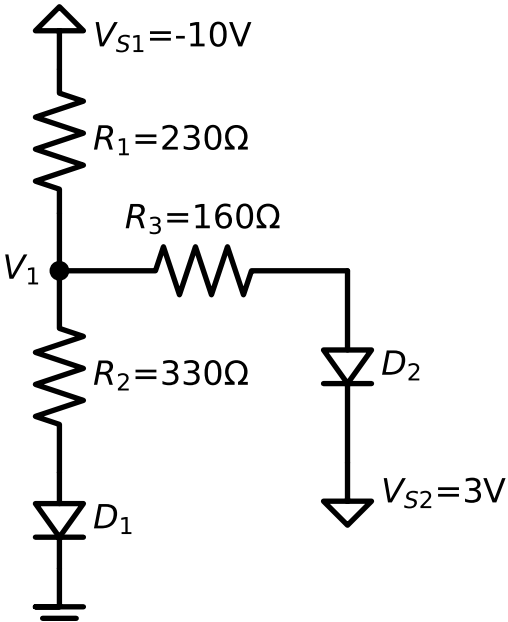
(e)


V_S=-10V
R=20Ω
D_{IDEAL}


V_S=-10V
R=20Ω
I_D=500.0mA
FB: V_D=0

(f)


V_S=-8V
R=360Ω
D_{IDEAL}
V_B=9V
(a)
V_S=-8V
R=360Ω
+ RB: I_D=0
– V_D=-17V
V_B=9V
V_S=-7V
R=40Ω
D_{IDEAL}
V_B=4V
(b)
V_S=-7V
R=40Ω
FB: V_D=0
I_D=275.0mA
V_B=4V
V_S=-5V
R=280Ω
D_{IDEAL}
V_B=-10V
(c)
V_S=-5V
R=280Ω
FB: V_D=0
I_D=17.857mA
V_B=-10V
V_S=-2V
R=10Ω
D_{IDEAL}
V_B=10V
(d)
V_S=-2V
R=10Ω
FB: V_D=0
I_D=1200.0mA
V_B=10V
V_S=-1V
R=290Ω
D_{IDEAL}
V_B=-4V
(e)
V_S=-1V
R=290Ω
– RB: I_D=0
+ V_D=-3V
V_B=-4V
V_S=-10V
R=20Ω
D_{IDEAL}
V_B=-6V
(f)
V_S=-10V
R=20Ω
+ RB: I_D=0
– V_D=-4V
V_B=-6V



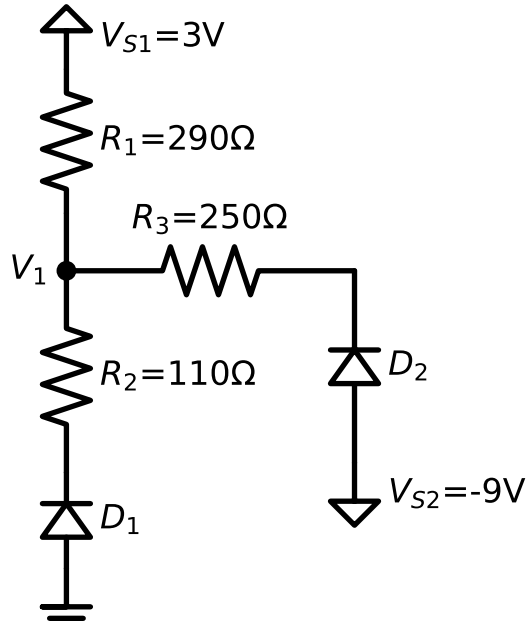
(a)

case1: FB, FB: V_1=-1.815
D_1:FB, V_{D1}=0V (short), I_{D1}=-5.5mA >0, False
D_2:FB, V_{D2}=0V (short), I_{D2}=-30.094mA >0, False

case2: FB, RB: V_1=-5.893
D_1:FB, V_{D1}=0V (short), I_{D1}=-17.858mA >0, False
D_2:RB, I_{D2}=0V (open), V_{D2}=-8.893V <=0, True

case3: RB, FB: V_1=-2.333
D_1:RB, I_{D1}=0V (open), V_{D1}=-2.333V <=0, True
D_2:FB, V_{D2}=0V (short), I_{D2}=-33.331mA >0, False

case4: RB, RB: V_1=-10.0
D_1:RB, I_{D1}=0V (open), V_{D1}=-10.0V <=0, True
D_2:RB, I_{D2}=0V (open), V_{D2}=-13.0V <=0, True



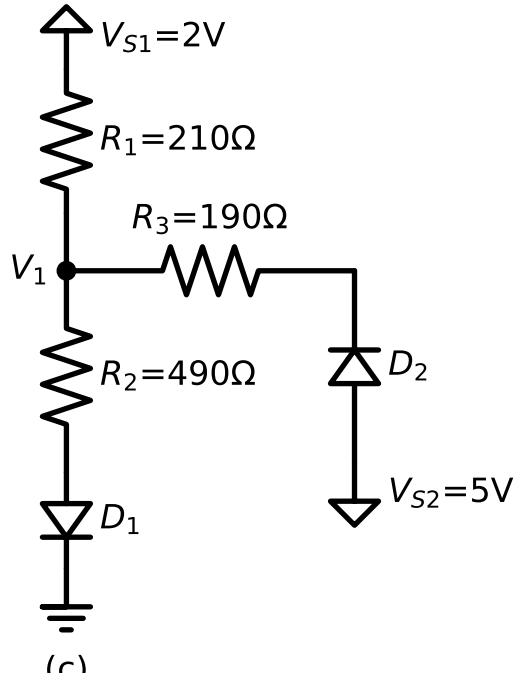
(b)

case1: FB, FB: V_1=-1.551
D_1:FB, V_{D1}=0V (short), I_{D1}=14.1mA >0, True
D_2:FB, V_{D2}=0V (short), I_{D2}=-29.796mA >0, False

case2: FB, RB: V_1=0.825
D_1:FB, V_{D1}=0V (short), I_{D1}=-7.5mA >0, False
D_2:RB, I_{D2}=0V (open), V_{D2}=-9.825V <=0, True

case3: RB, FB: V_1=-3.444
D_1:RB, I_{D1}=0V (open), V_{D1}=3.444V <=0, False
D_2:FB, V_{D2}=0V (short), I_{D2}=-22.224mA >0, False

case4: RB, RB: V_1=3.0
D_1:RB, I_{D1}=0V (open), V_{D1}=-3.0V <=0, True
D_2:RB, I_{D2}=0V (open), V_{D2}=-12.0V <=0, True



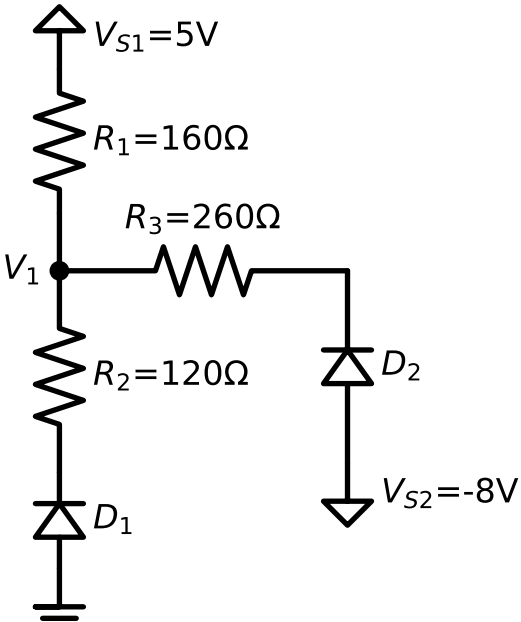
(c)

case1: FB, FB: V_1=2.97
D_1:FB, V_{D1}=0V (short), I_{D1}=6.061mA >0, True
D_2:FB, V_{D2}=0V (short), I_{D2}=10.684mA >0, True

case2: FB, RB: V_1=1.4
D_1:FB, V_{D1}=0V (short), I_{D1}=2.857mA >0, True
D_2:RB, I_{D2}=0V (open), V_{D2}=3.6V <=0, False

case3: RB, FB: V_1=3.575
D_1:RB, I_{D1}=0V (open), V_{D1}=3.575V <=0, False
D_2:FB, V_{D2}=0V (short), I_{D2}=7.5mA >0, True

case4: RB, RB: V_1=2.0
D_1:RB, I_{D1}=0V (open), V_{D1}=2.0V <=0, False
D_2:RB, I_{D2}=0V (open), V_{D2}=3.0V <=0, False



(d)

case1: FB, FB: V_1=0.026
D_1:FB, V_{D1}=0V (short), I_{D1}=-0.217mA >0, False
D_2:FB, V_{D2}=0V (short), I_{D2}=-30.869mA >0, False

case2: FB, RB: V_1=2.143
D_1:FB, V_{D1}=0V (short), I_{D1}=-17.858mA >0, False
D_2:RB, I_{D2}=0V (open), V_{D2}=-10.143V <=0, True

case3: RB, FB: V_1=0.048
D_1:RB, I_{D1}=0V (open), V_{D1}=-0.048V <=0, True
D_2:FB, V_{D2}=0V (short), I_{D2}=-30.954mA >0, False

case4: RB, RB: V_1=5.0
D_1:RB, I_{D1}=0V (open), V_{D1}=-5.0V <=0, True
D_2:RB, I_{D2}=0V (open), V_{D2}=-13.0V <=0, True