In[143]:=
```
Clear[Vgs];
i = 0.0005;
Vp = 5;
Vn = -5;
Kn = 0.0005;
Vtn = 0.8;
λ = 10^-4;
c = 100 * 10^-6;
Vdsq = 2.5;
Av = -5;
Rin = 20 000;
fRin = R3 * R2 / (R2 + R3);
gm = 2 * Sqrt[Kn * i];
r0 = 1 / (λ * i);
(1 - gm) / -2 gm;
Au = -5;
Rd = Au / -gm
(*Vgs=1.7998750234326182;*)
```

Out[159]= 5000.

In[186]:=
```
Clear[a, b, c, d, e, i1]
a = Solve[i == Kn (Vgs - Vtn)^2 * (1 + λ * Vdsq), Vgs] // Flatten;
a = a[[2]]
Rs = Rd;
b = Vgs + Rs * i - R3 / (R1 + R2 + R3) * (Vp - Vn) /. a



vr1 = 3.2;
vr2 = 2.5;
vr3 = 4.3;
Solve[{i2 * R1 == vr1, i2 * R2 == vr2, i2 * R3 == vr3; fRin == Rin, b == 0},
 {R1, R2, R3, i2}]



(*r3=Solve[Rs*i-Rin(Vp-Vn)/R3+Vgs==0,R3]/.a//Flatten
    Vdsq+Rs*i-Rin/R3(Vp-Vn)-(R3+R1)/(R1+R2+R3)+Vgs/.a/.r3//Flatten
    Solve[{fRin,%==0},{R1,R2}]/.r3*)
```

Out[188]= $Vgs \to 1.79988$

Out[190]= $4.29988 - \dfrac{10\,R3}{R1 + R2 + R3}$

Solve::ratnz : Solve was unable to solve the system with inexact coefficients. The answer was obtained by solving a corresponding exact system and numericizing the result. >>

Out[194]= $\{\{R1 \to 40\,484.5,\ R2 \to 31\,628.5,\ R3 \to 54\,398.2,\ i2 \to 0.0000790426\}\}$