

Aula 05

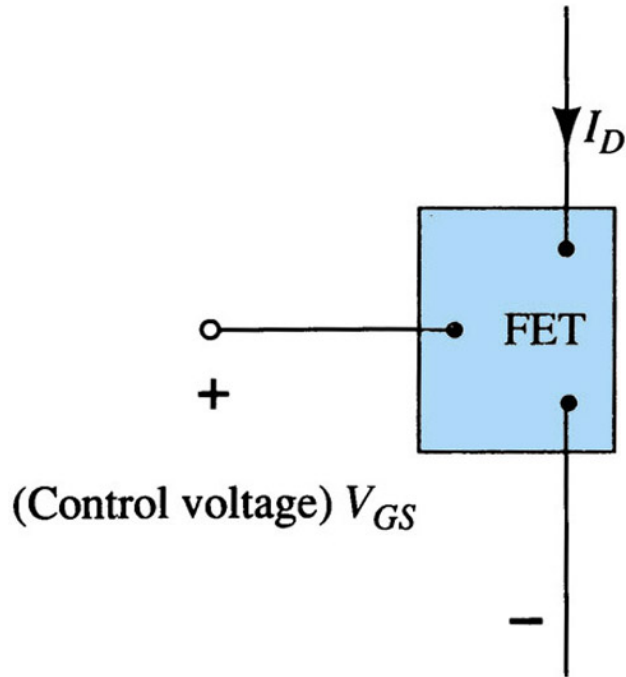
Polarização do JFET -

Soluções Gráficas e Matemáticas

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Polarização do JFET

Equações Básicas:

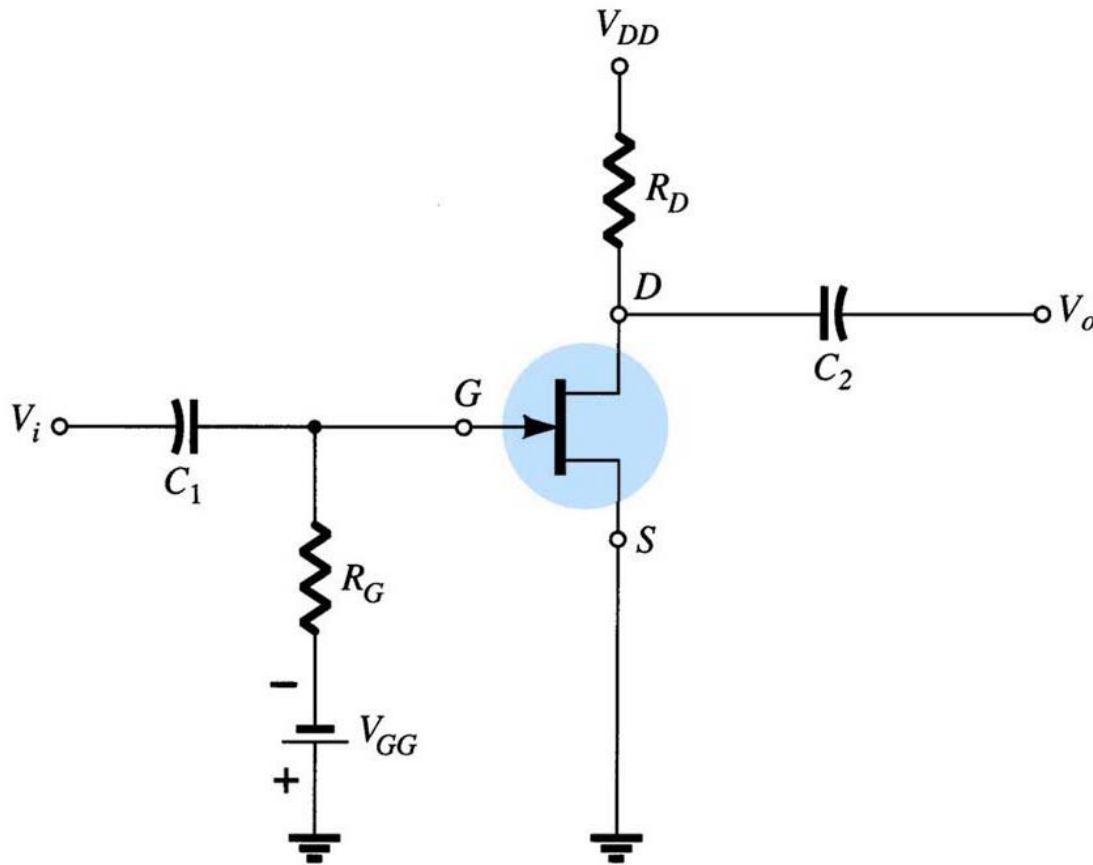


$$I_G = 0A \quad [6.1]$$

$$I_D = I_S \quad [6.2]$$

$$I_D = I_{DSS} \left(1 - \frac{V_{GS}}{V_P}\right)^2 \quad [6.3]$$

Configuração com Polarização Fixa

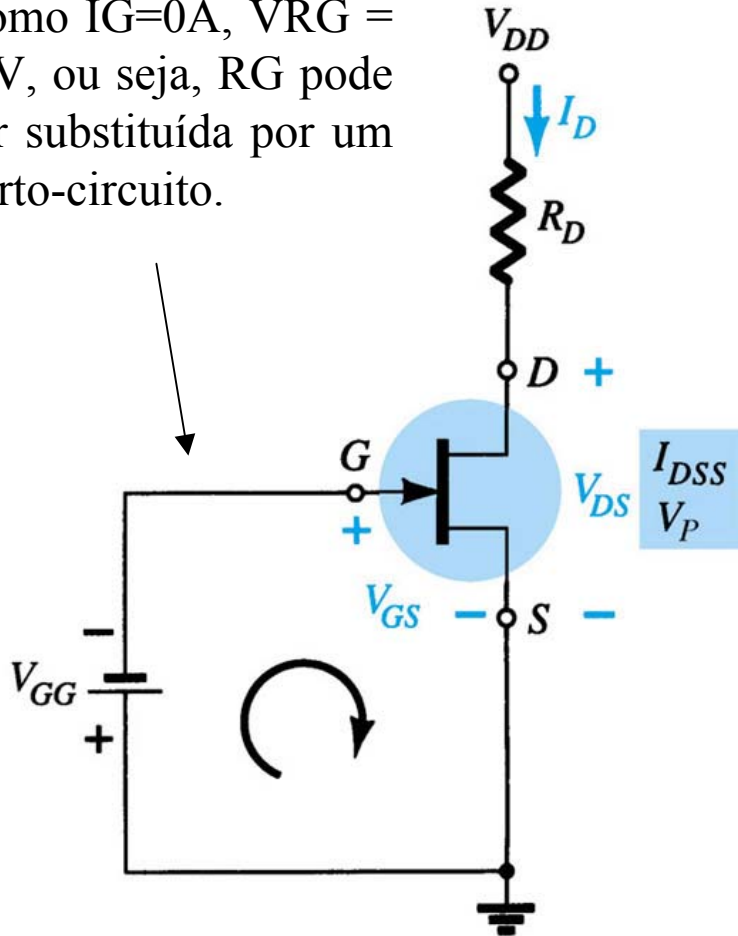


- C_1 , C_2 : Capacitores de acoplamento.
- R_G : Garantir que V_i apareça na entrada do amplificador FET em CA.

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Circuito Equivalente CC

Como $I_G=0A$, $V_{RG} = 0V$, ou seja, R_G pode ser substituída por um curto-circuito.



$$V_{DS} = V_{DD} - I_D R_D \quad [6.6]$$

$$V_S = 0V \quad [6.7]$$

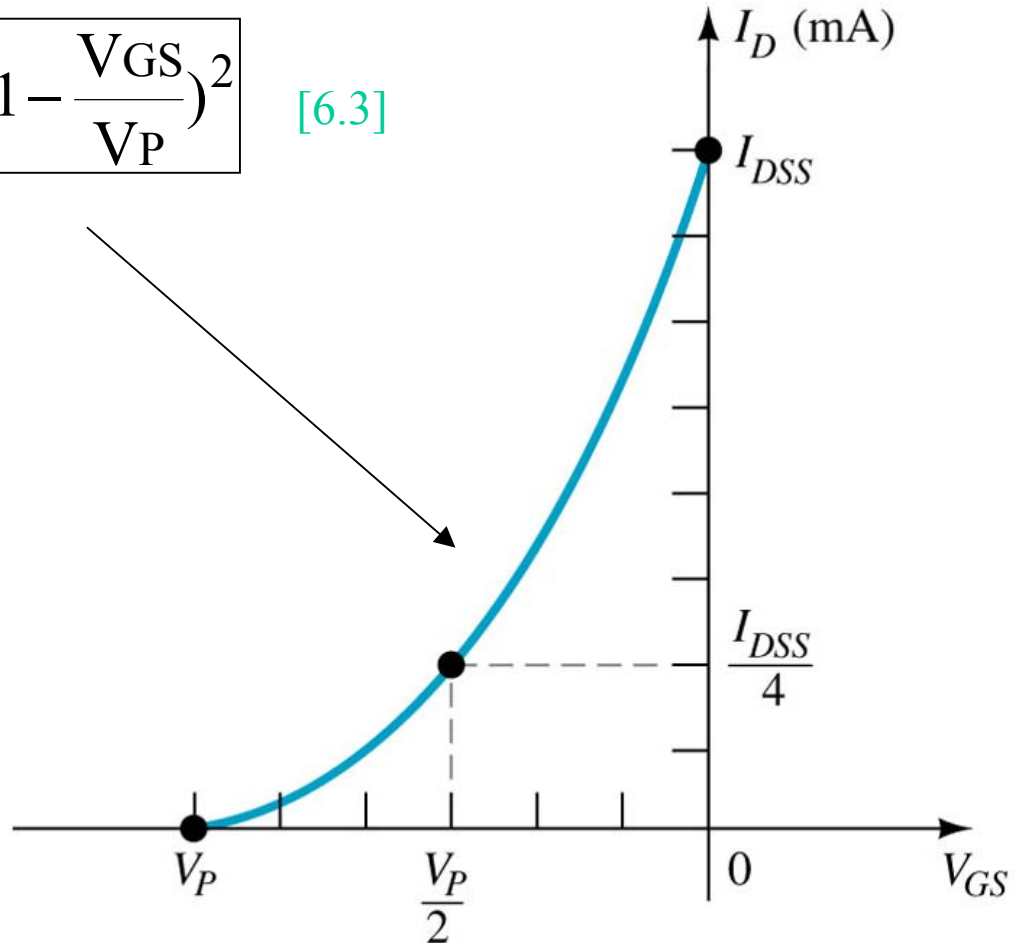
$$V_D = V_{DS} \quad [6.8]$$

$$V_G = V_{GS} \quad [6.9]$$

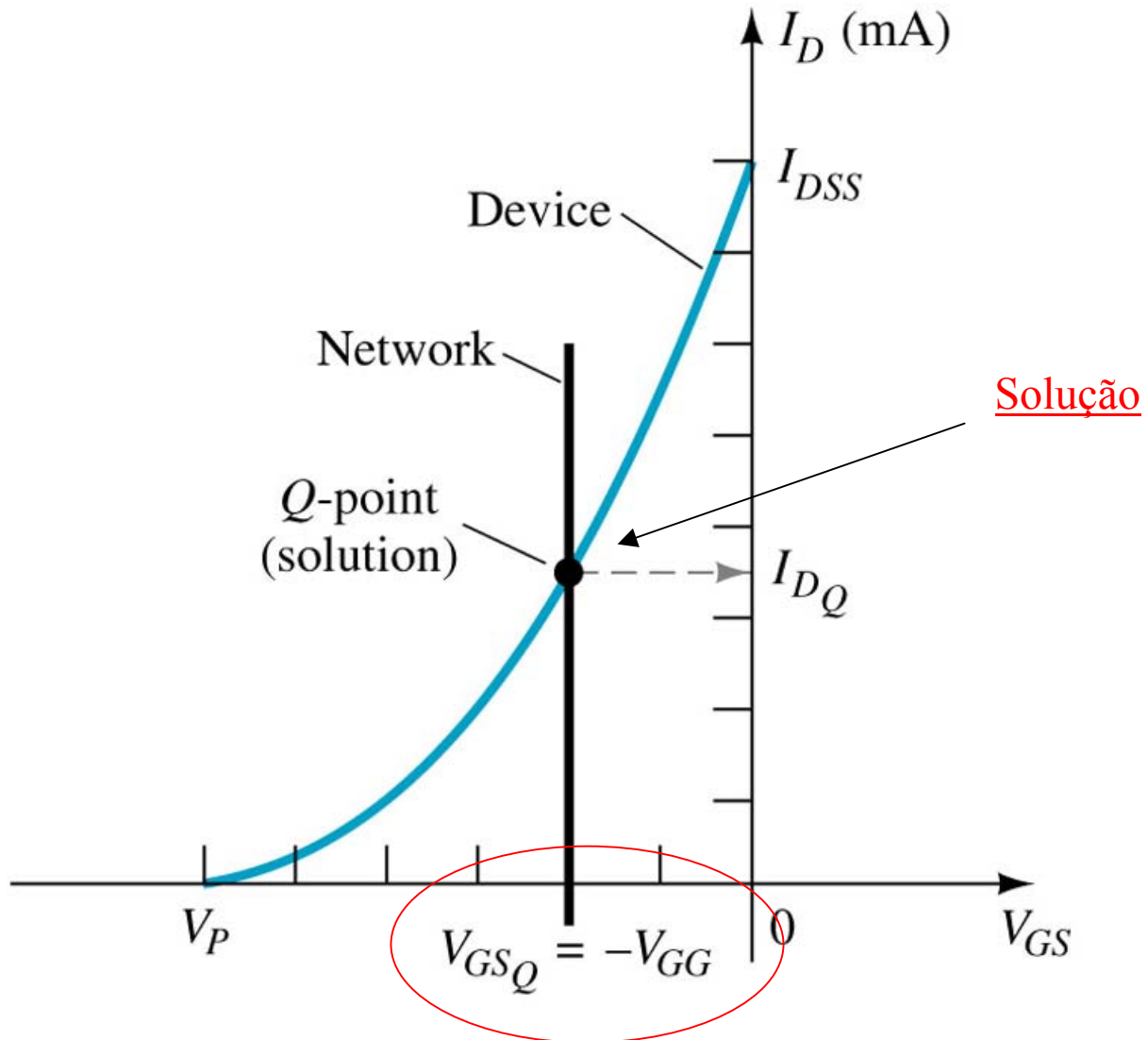
$$V_{GS} = -V_{GG} \quad [6.5]$$

1o passo: Traçar a curva de transferência.

$$I_D = I_{DSS} \left(1 - \frac{V_{GS}}{V_P}\right)^2 \quad [6.3]$$

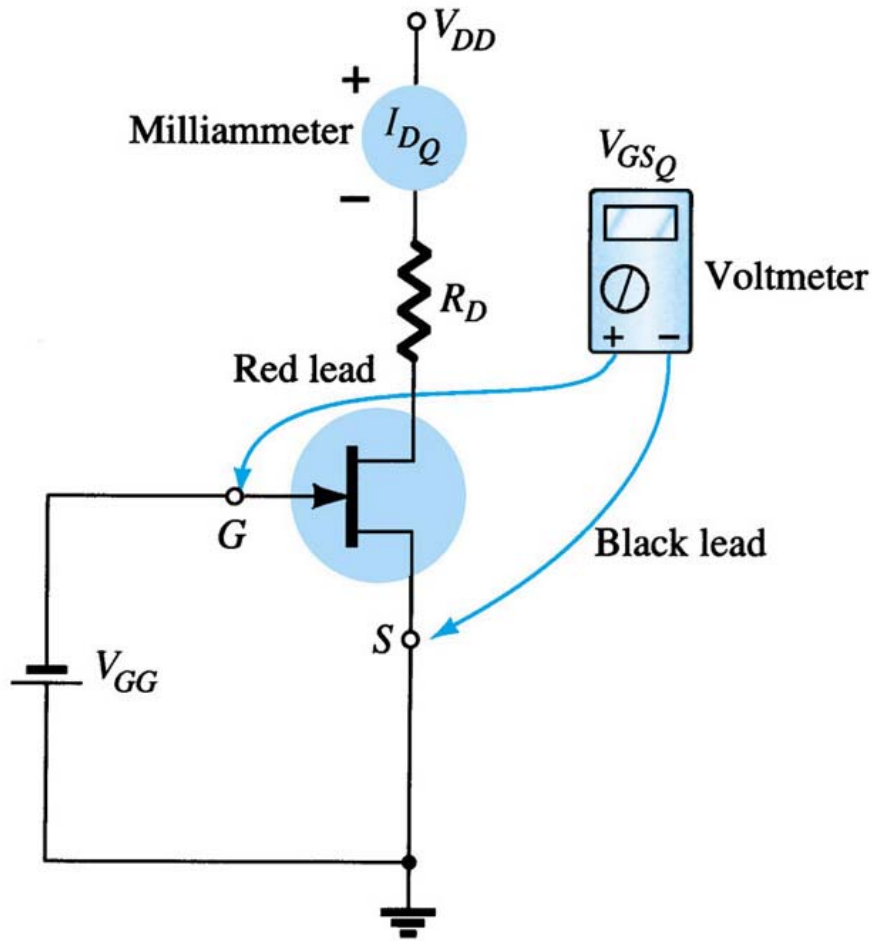


Solução Gráfica



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Medidas dos ponto quiescentes



$$V_{DS} = V_{DD} - I_D R_D$$

$$V_S = 0V$$

$$V_D = V_{DS}$$

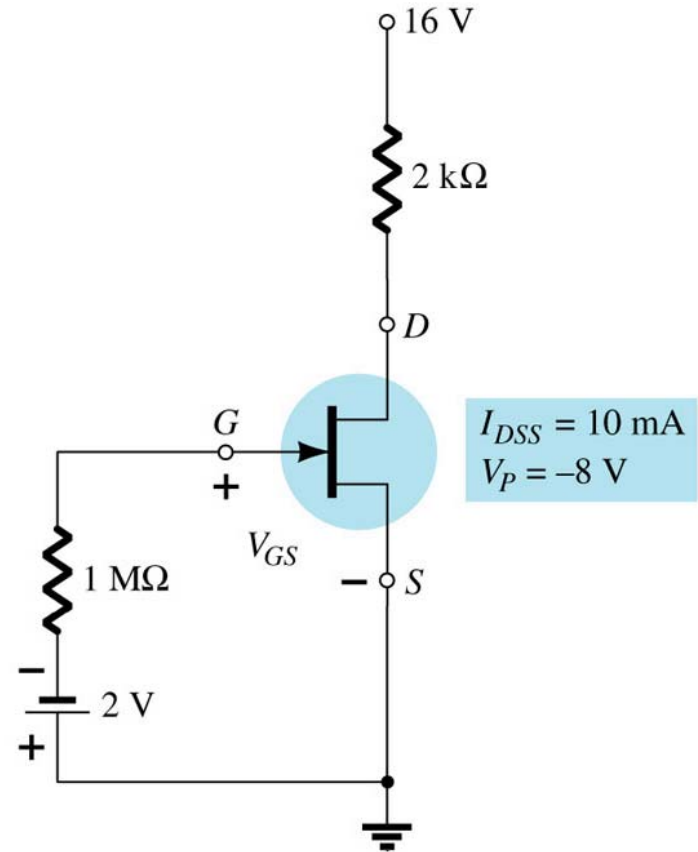
$$V_G = V_{GS}$$

$$V_{GS} = -V_{GG}$$

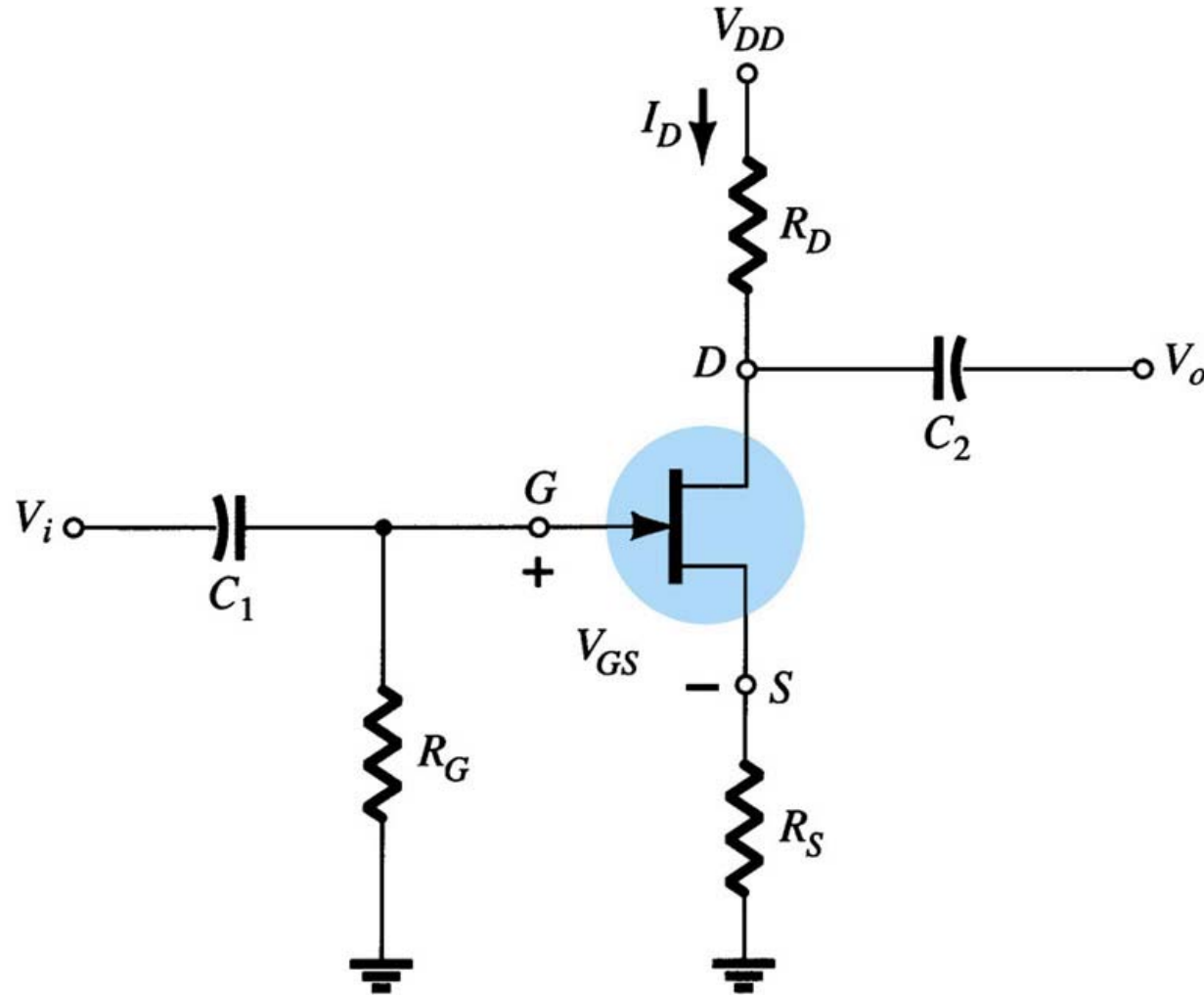
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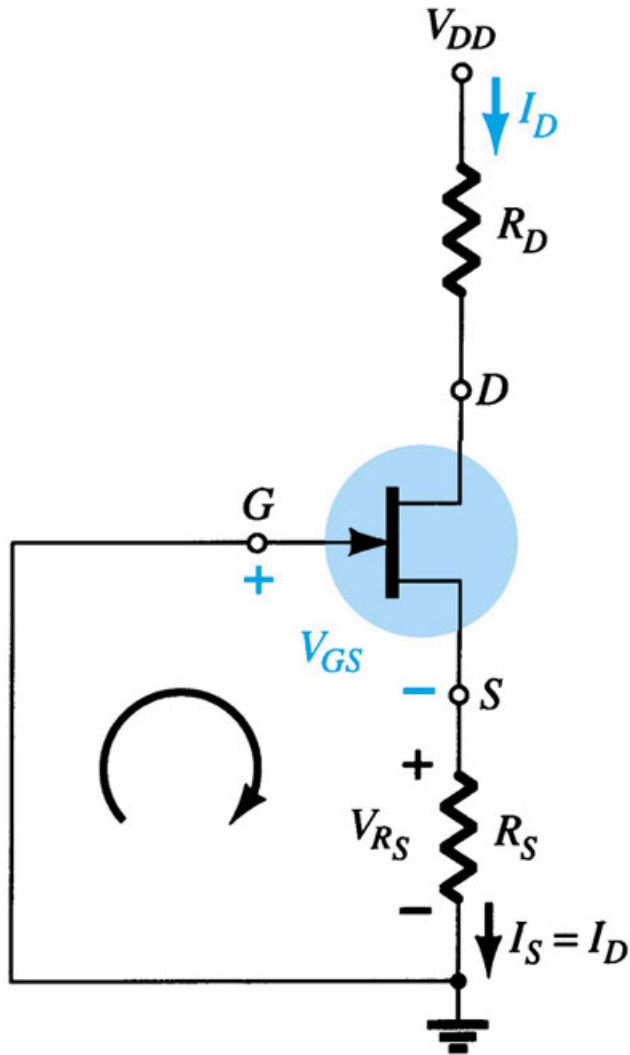
Exemplo 6.1* Determinar os parâmetros V_{GSQ} , I_{DQ} , V_{DS} , V_D , V_G , V_S utilizando:

- Método Gráfico.
- Método Numérico.



Configuração com Auto Polarização



Circuito Equivalente CC

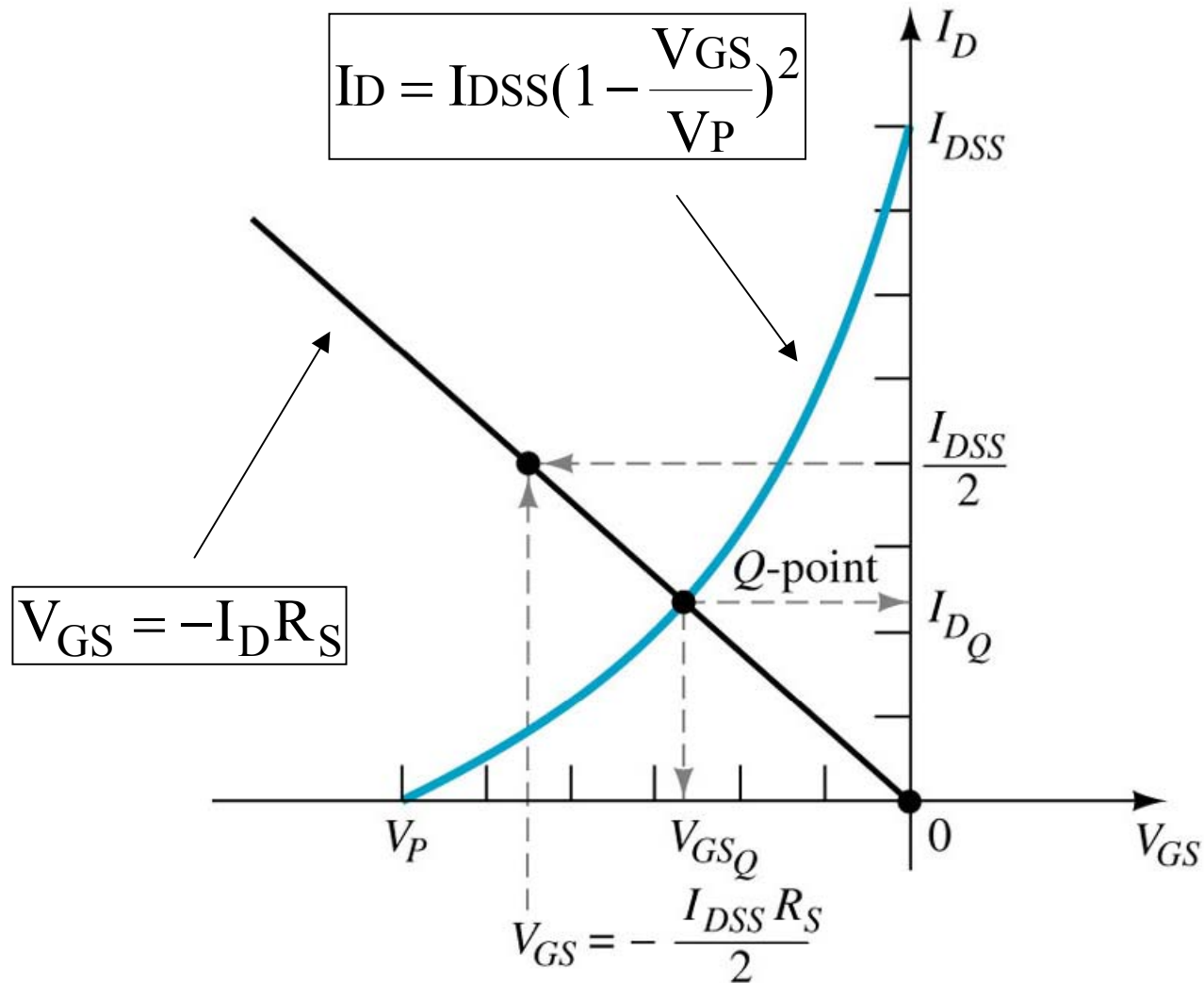
$$V_{GS} = -I_D R_S \quad [6.10]$$

$$V_{DS} = V_{DD} - I_D (R_S + R_D) \quad [6.11]$$

$$V_S = I_D R_S \quad [6.12]$$

$$V_D = V_{DS} + V_S = V_{DD} - V_{RD} \quad [6.14]$$

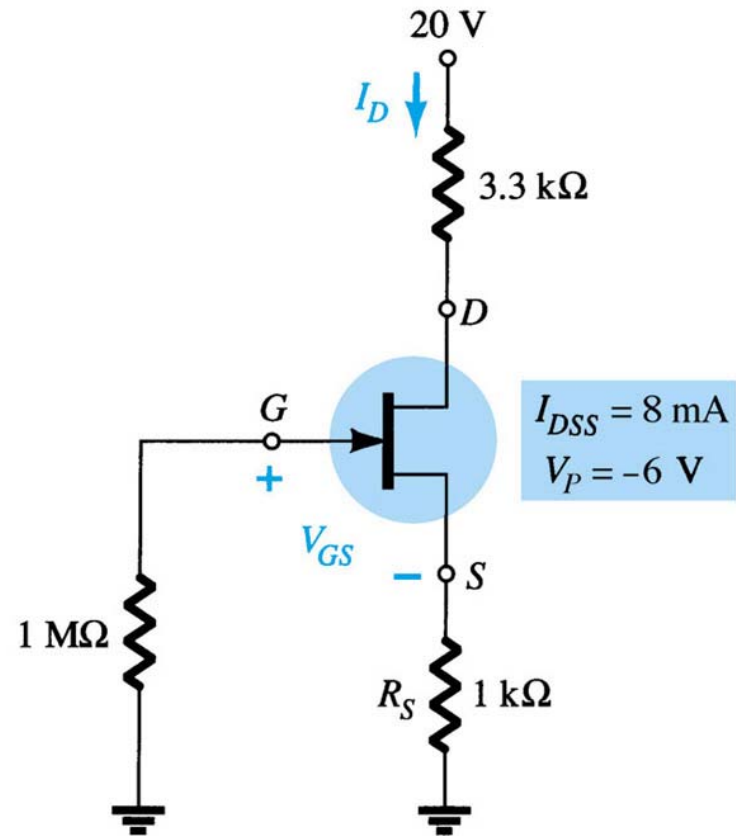
Solução Gráfica



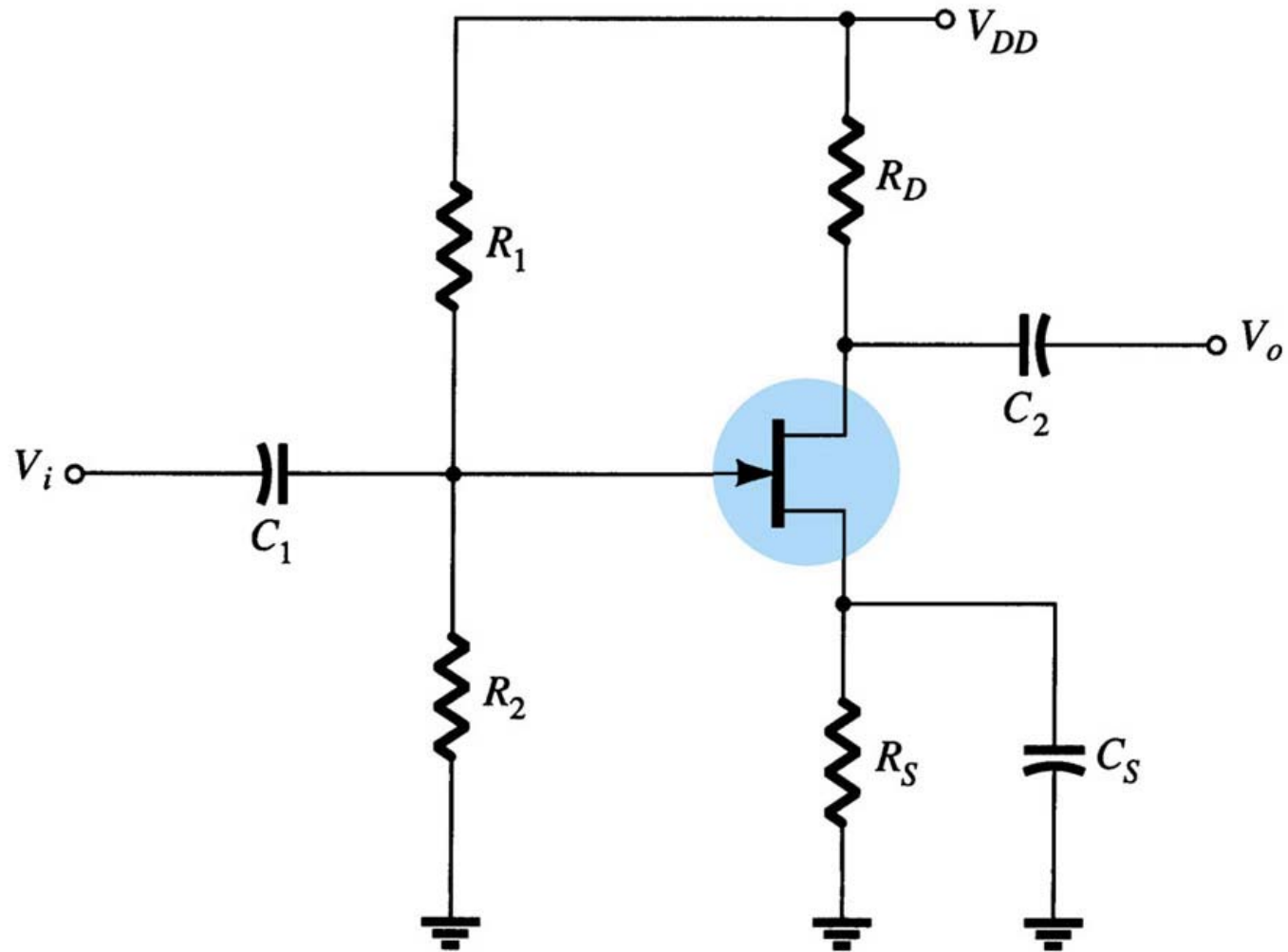
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Exemplo 6.2* Determinar os parâmetros V_{GSQ} , I_{DQ} , V_{DS} , V_D , V_G , V_S utilizando:

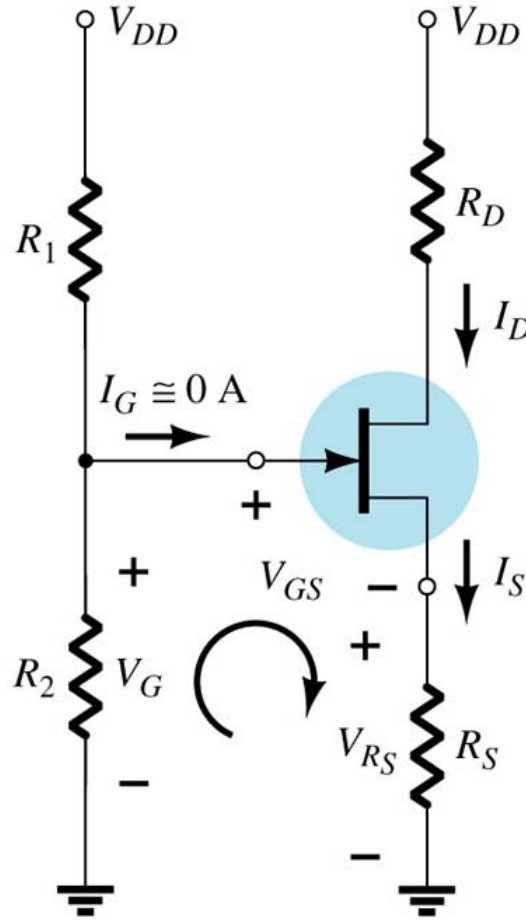
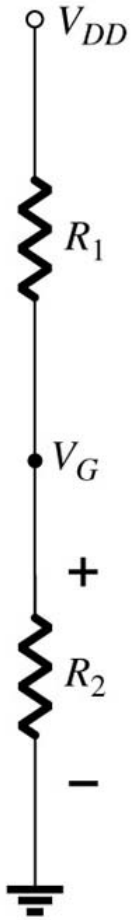
- Método Gráfico.
- Método Numérico.



Polarização por Divisor de Tensão



Circuito Equivalente CC



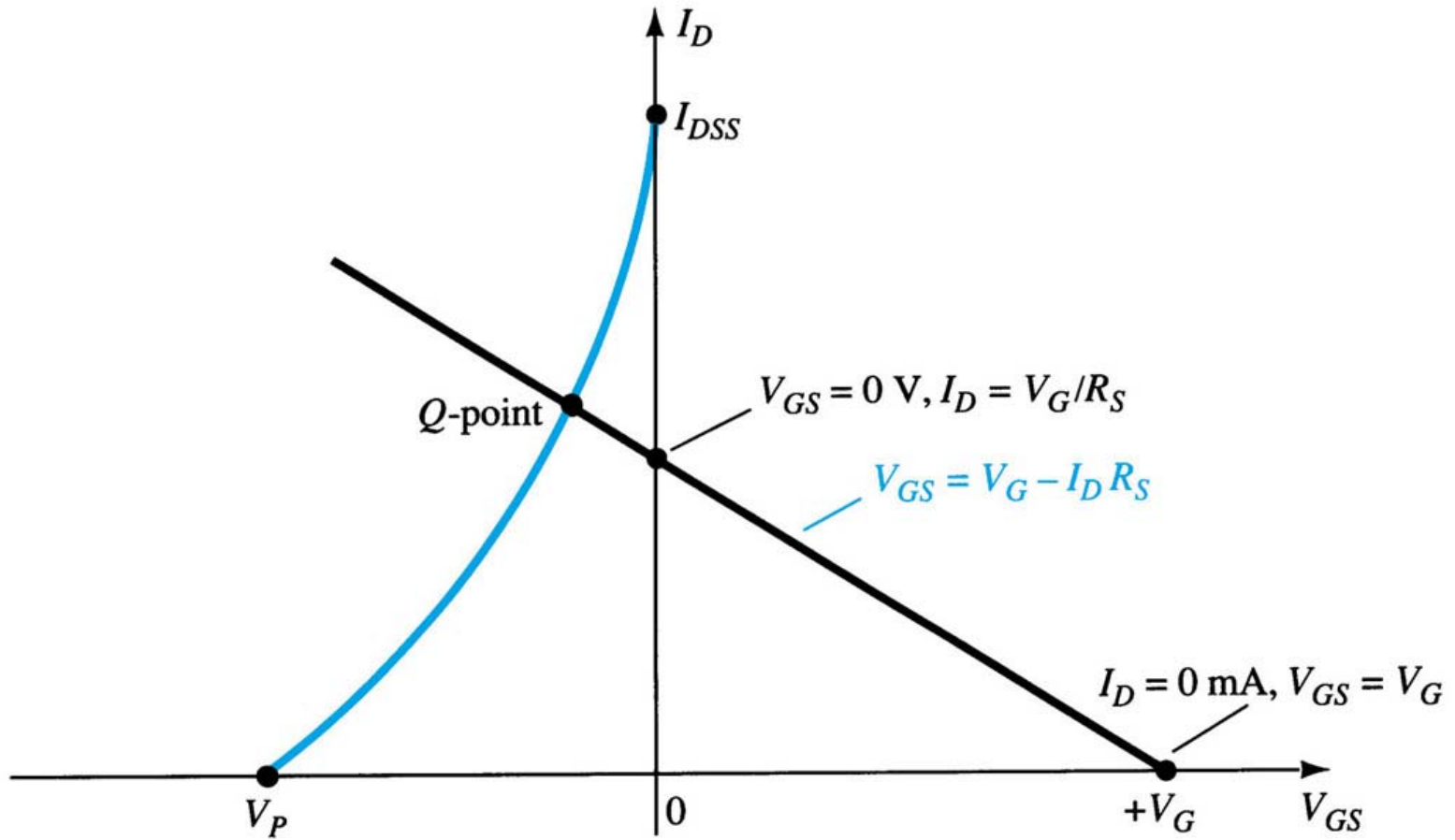
$$V_G = \frac{R_2 V_{DD}}{R_1 + R_2} \quad [6.15]$$

$$V_G - V_{GS} - V_{RS} = 0$$

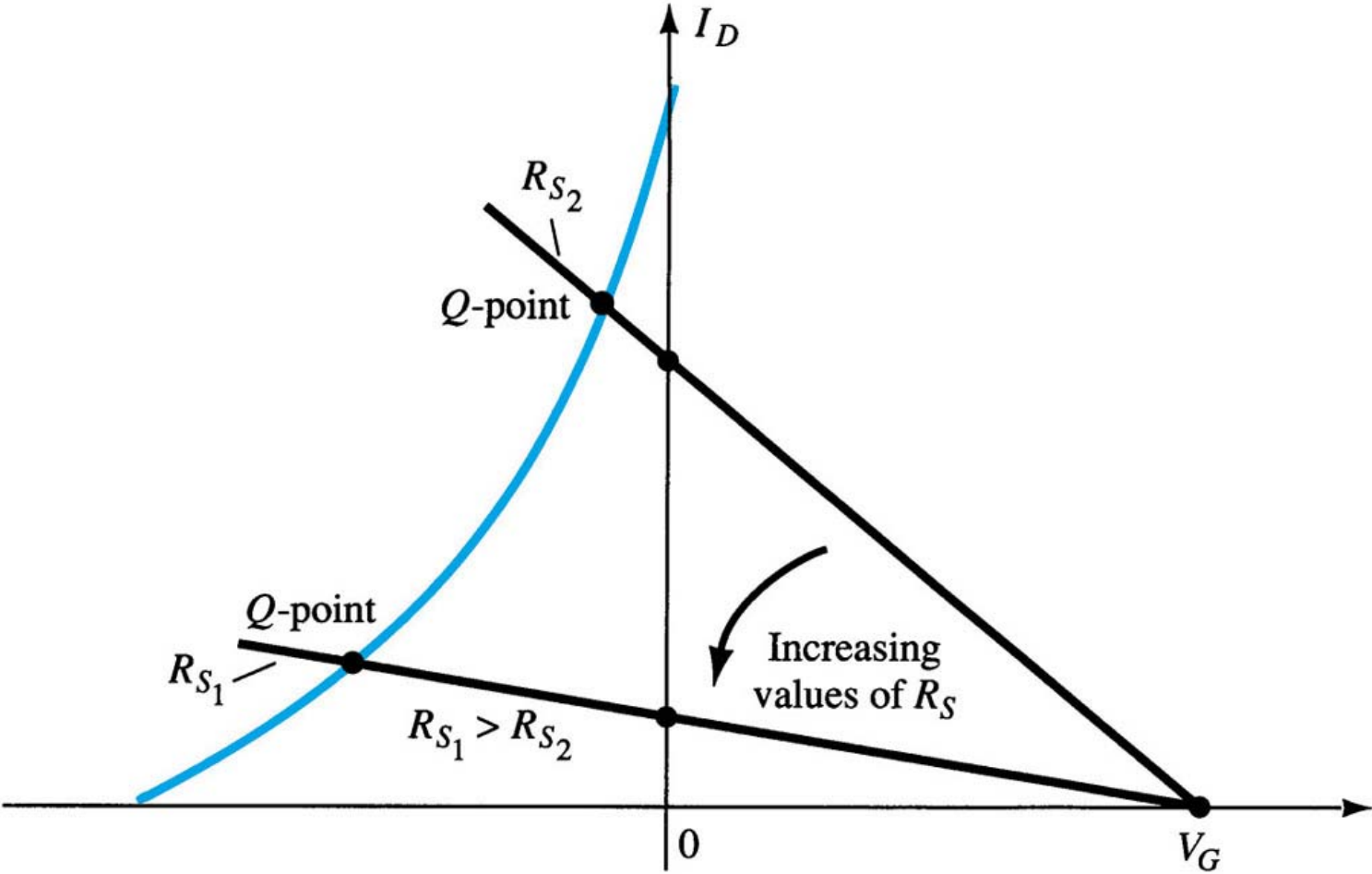
$$V_{GS} = V_G - I_D R_S \quad [6.16]$$

$$I R_1 = I R_2 = \frac{V_{DD}}{R_1 + R_2} \quad [6.22]$$

Solução Gráfica



Solução Gráfica



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Exemplo 6.5 Determinar os parâmetros V_{GSQ} , I_{DQ} , V_{DS} , V_{DG} , V_G , V_S utilizando o método gráfico.

