1. Use graphical analysis to determine the value of the drain current \( I_D \) in the circuit below.

\[ V_p = -3 \text{ volts} \quad \text{IDSS} = 12\text{mA} \]
2. For the circuit below use graphical techniques to estimate $I_{DQ}$.

$$I_{DSS} = 8\text{mA} \quad V_t = -3\text{V}$$
3. In the JFET amplifier circuit below determine the following,
   a) magnitude of the voltage gain, $V_o/V_s$.
   b) input resistance just to the right of $C_1$.
   c) Output resistance.

$$g_m = 6\text{mmho}$$

$$\text{mag of } A_v = g_m \times R_D = 6$$
4. For the circuit in Problem 3 write the network equations that involve the drain current and,

a) \( V_{GS} \)

b) \( V_{DS} \)