

Lab 1 Record

Section _____

Names: _____

Common-Source Amplifier

g_m ($I_d \approx 20\text{mA}$): _____

V_T : _____

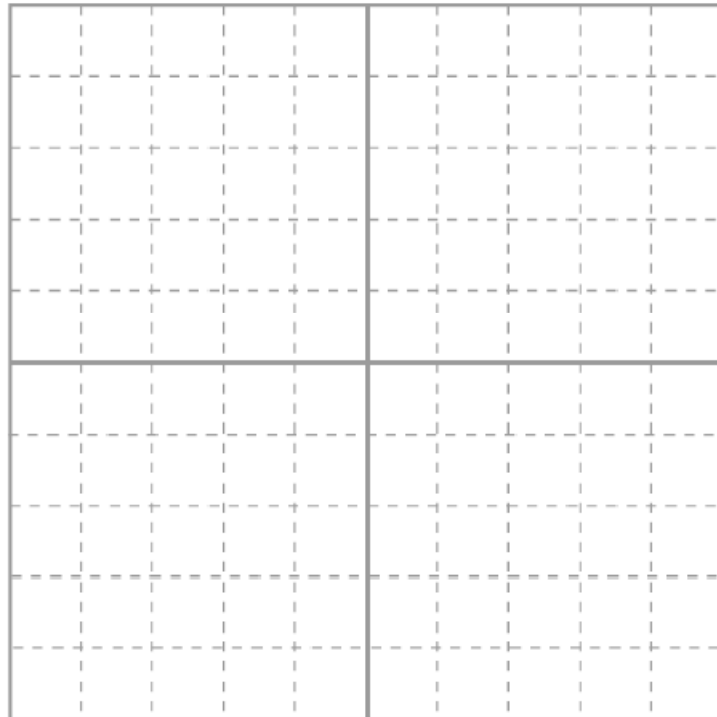
Current Parameter, K_n : _____

R_{g1} : _____

I_d (with R_{g1}): _____

V_d (with R_{g1}): _____

Input and Output Waveforms with a 0.1V, 1kHz sinusoid input

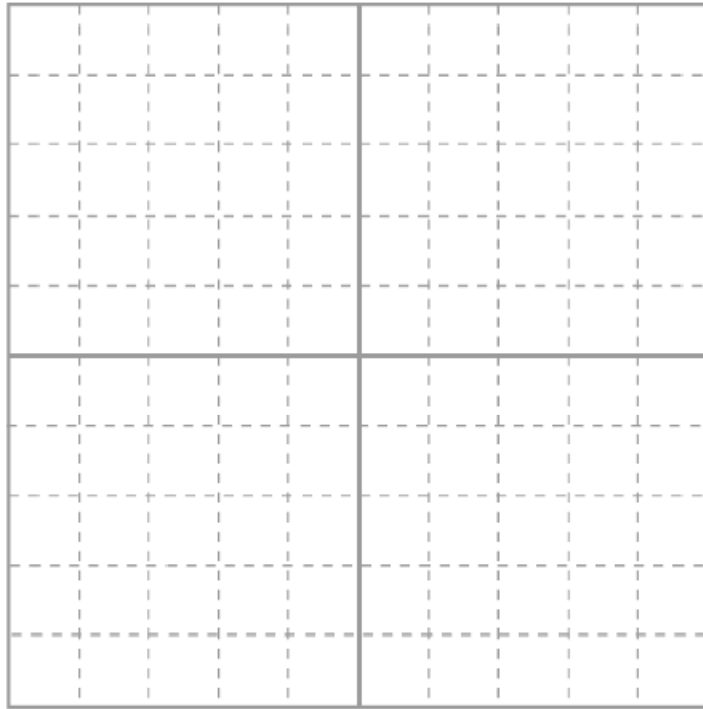


Voltage Gain (with 220Ω): _____

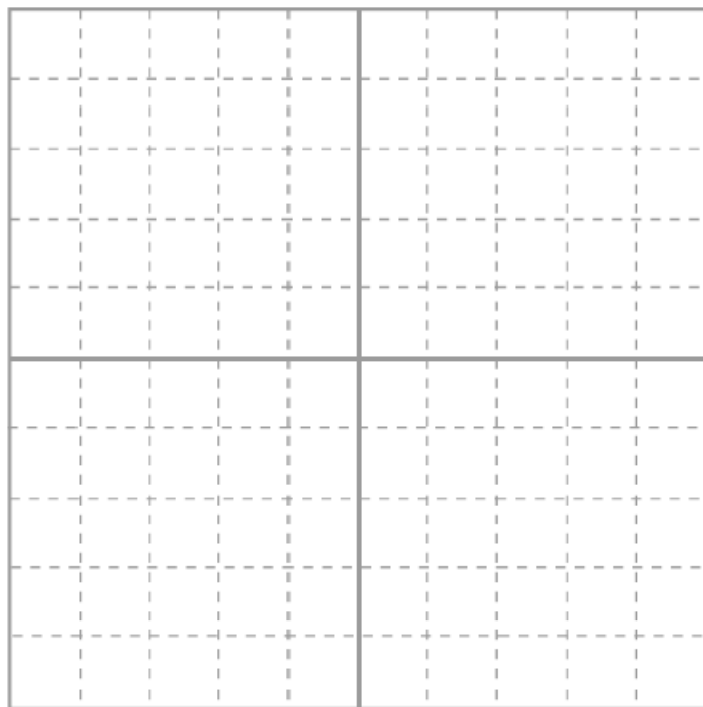
Voltage Gain (with 100Ω): _____

Linearity and Waveform Distortion

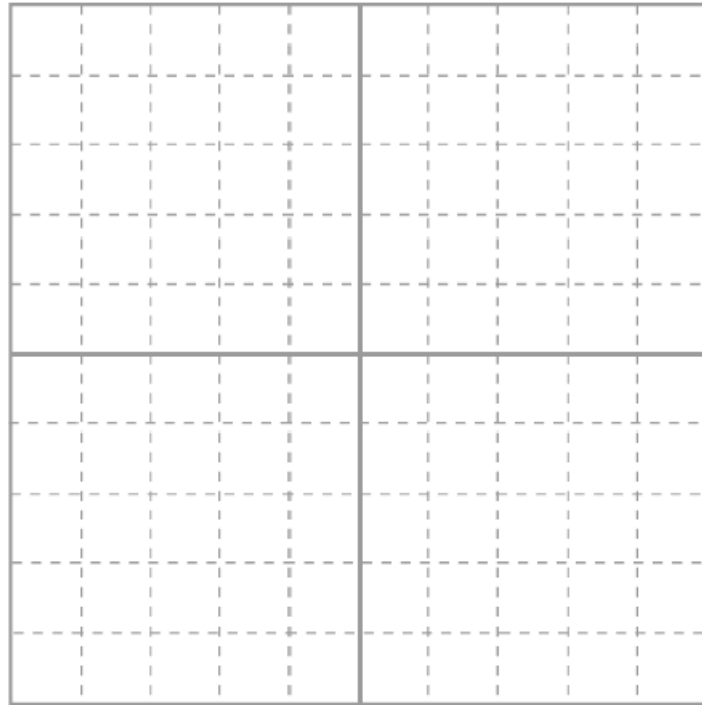
Output Waveform with a 0.2V, 1kHz sinusoid input



Output Waveform with a 0.5V, 1kHz sinusoid input



Output Waveform with a 0.1V, 1kHz sinusoid input, 470Ω resistor



Why is there signal distortion when the 220Ω drain resistor is changed to 470Ω?

Effect of Source and Load Impedances

Voltage gain ($R_L=R_D$): _____

Voltage gain (with R_{sig}): _____

Input Impedance: _____

Output Impedance: _____

Open-circuit voltage gain: _____

Source resistance of function generator: _____

Input resistance of oscilloscope: _____

Common-Source with Source Resistor

Voltage Gain (under open-circuit conditions, 0.1V input sinusoid at 1kHz): _____

Voltage Gain (with 10μF capacitor): _____

Common-Gate Amplifier

Voltage Gain (V_{out}/V_{in}): _____

Why does the input waveform change significantly when the 10V power supply is turned off?

Overall Gain of Circuit (V_{out}/V_{sig}): _____

Voltage Gain (with 1μF capacitor): _____

Amplifiers with Active Loading

g_m ($I_d \approx 5mA$): p-channel: _____ n-channel: _____

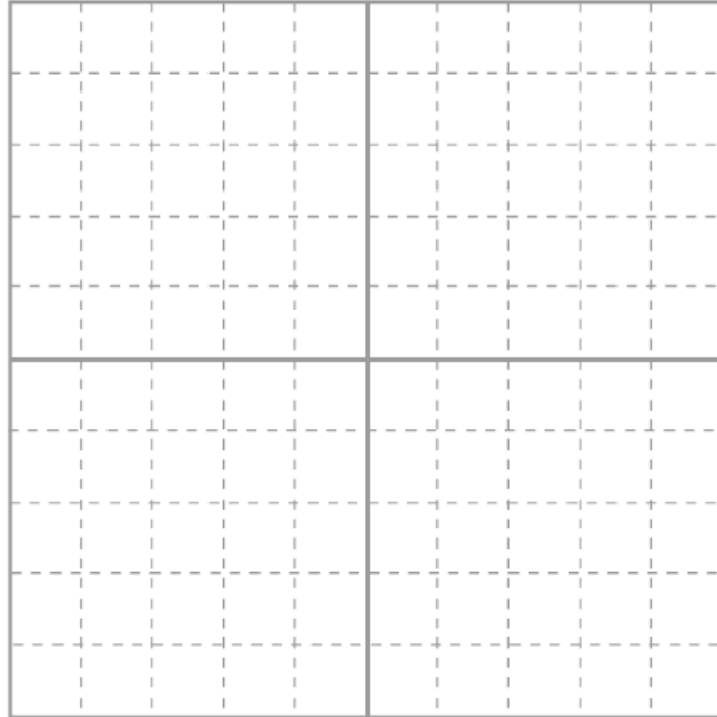
V_T : p-channel: _____ n-channel: _____

Current Parameter, K_n : p-channel: _____ n-channel: _____

$V_g(Q2)$: _____

$V_d(Q1)$: _____

Input and Output Waveforms with a 0.1V, 1kHz sine-wave input



Intrinsic Voltage Gain: _____

Voltage Gain($R_L=1K\Omega$): _____

TA Signature: _____

Date: _____