Unit 9 - Week 7 - Opamp controlled sources; Virtual short; Swing limits; Summary of amplifiers

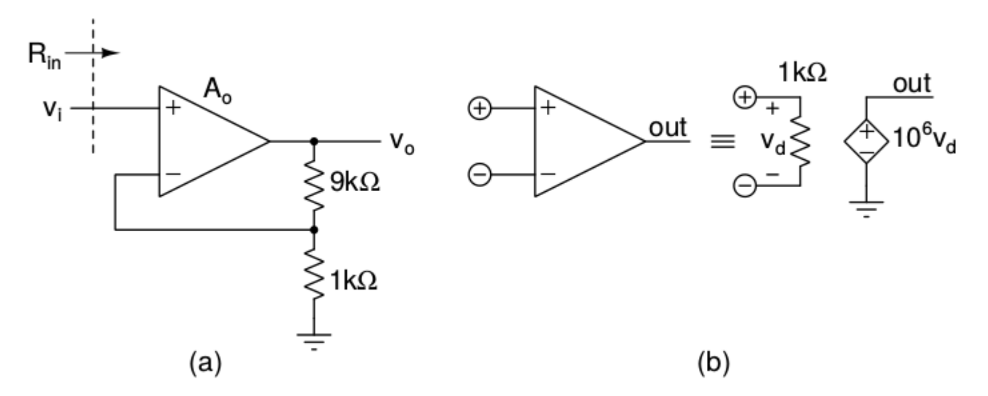
Course outline

Assignment 7

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-03-18, 23:59 IST.

1)



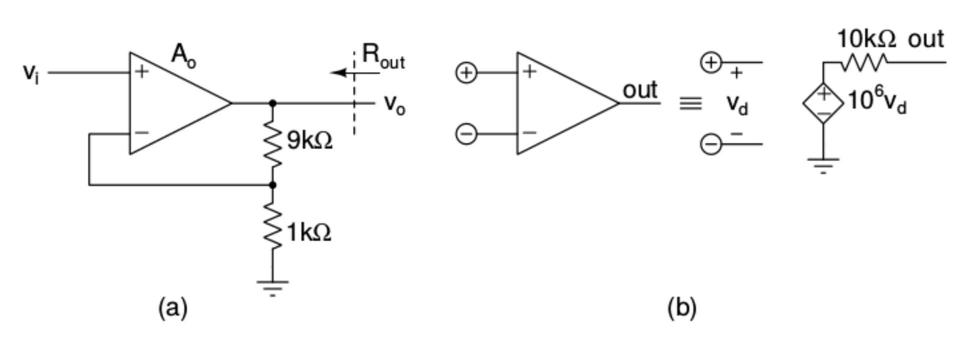
In the circuit above, the opamp has a gain of 10^6 and an input resistance of $1\,\mathrm{k\Omega}$. Determine the input resistance R_{in} of the non-inverting amplifier.

(The answer must be in **megohms** ($\mathrm{M\Omega}$). Round off fractional answers to the nearest integer.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 100

1 point

2)



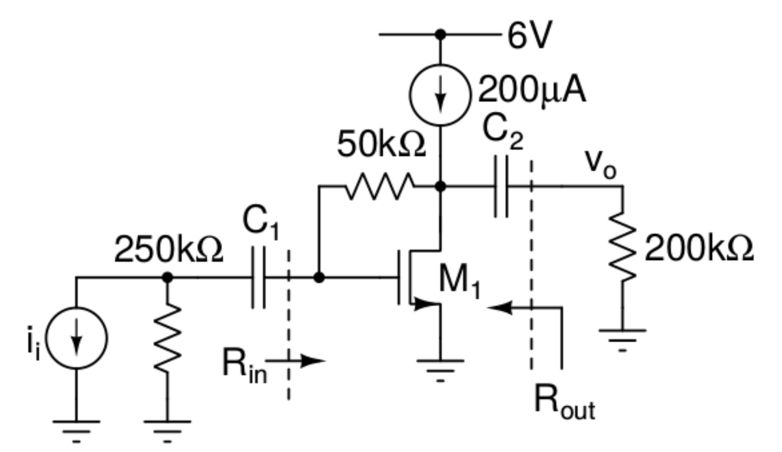
In the circuit above, the opamp has a gain of 10^6 and an output resistance of $10\mathrm{k\Omega}$. Determine the output resistance R_{out} of the non-inverting amplifier.

(The answer must be in **ohms** (Ω). Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 0.1

1 point

3)



$\mu_n C_{ox} = 100\mu\mathrm{A/V^2}, W/L = 1, V_T = 1\,\mathrm{V}.$

In the circuit above, determine the value of i_i at which M_1 enters triode region. Assume that the capacitors are shorts at the signal frequency.

(The answer must be in **microamperes** (μA). Round off fractional answers to the nearest integer.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) -21,-20

1 point

4)

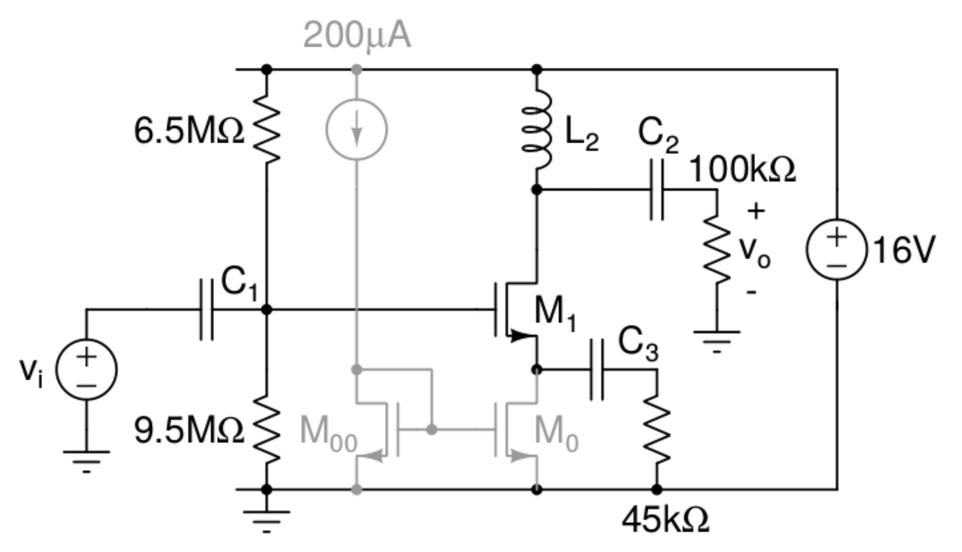
In the circuit above, determine the value of i_i at which M_1 just cuts off. Use the criterion based on the drain current. Assume that the capacitors are shorts at the signal frequency.

(The answer must be in **microamperes** (μA). Round off fractional answers to the nearest integer.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 167,169

1 point

5)



$\mu_n C_{ox} = 100\mu\mathrm{A/V^2}, W/L = 1, V_T = 1\,\mathrm{V}.$

In the figure above, the source degenerated amplifier using M_1 is biased using a current mirror $M_{00} - M_0$. Assume that the capacitors are shorts and the inductor is open at the signal frequency.

Determine the input voltage v_i at which M_1 enters triode region.

(The answer must be in **volts (V)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 2.5

1 point

6)

In the above figure, determine the input voltage v_i at which M_1 just cuts off.

(The answer must be in **volts (V)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) -10

1 point

7)

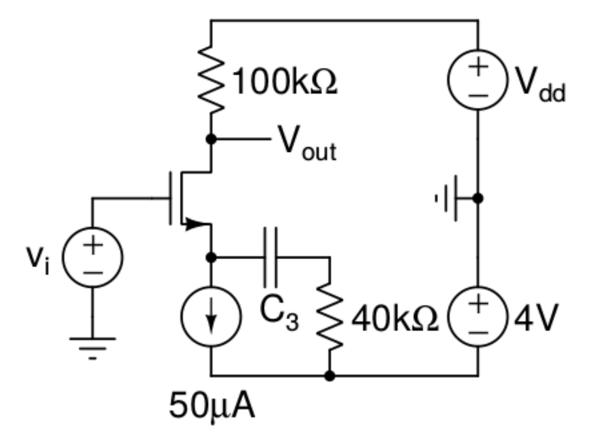
In the above figure, determine the input voltage v_i at which M_0 enters triode region.

(The answer must be in **volts (V)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) -5

1 point

8)



$\mu_n C_{ox} = 100\mu\mathrm{A/V^2}, W/L = 1, V_T = 1\,\mathrm{V}.$

In the figure above, $v_i = V_p \cos(\omega t)$. Determine the supply voltage V_{dd} such that the amplifier limits simultaneously on the positive and negative peaks of the input sinusoid.

(The answer must be in **volts (V)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 11.5

1 point

9)

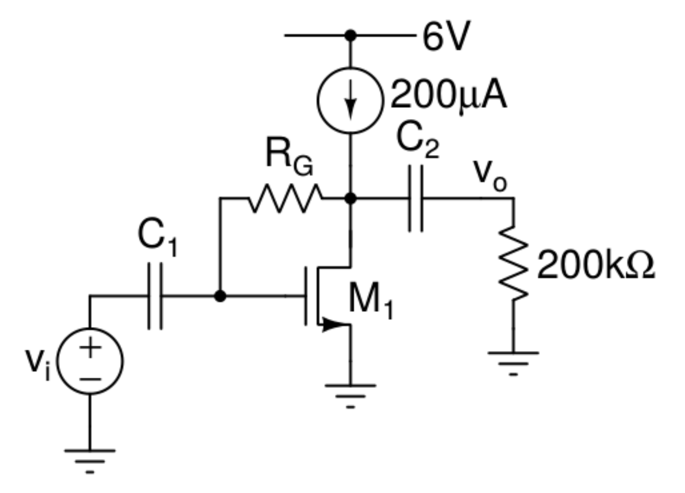
What is the maximum amplitude V_p that can be applied to the circuit with the above determined V_{dd}?

(The answer must be in **volts (V)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 2.5

1 point

10)



$\mu_n C_{ox} = 100\mu\mathrm{A/V^2}, W/L = 1, V_T = 1\,\mathrm{V}.$

In the figure above, $v_i = V_p \cos(\omega t)$. Determine the maximum V_p such that the transistor stays in the desired region. Assume that C_1, C_2, and R_G are all very large.

(The answer must be in millivolts (mV). Round off fractional answers to two decimal places.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 24.3, 24.4

1 point