TFE 4200 Analog Integrated Circuits

Problem sheet #6

1. Design an inverting amplifier (see Fig. 1) having a gain of -10 and an input resistance of 100 KΩ. [Give the values of R1 and R2.]

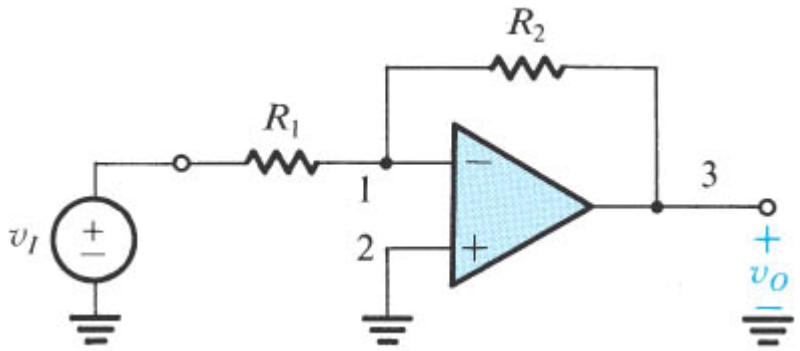

Fig. 1

2. The circuit shown in Fig. 2(a) can be used to implement a transresistance amplifier. Find the value of the input resistance Ri, the transresistance Rm, and the output resistance Ro of the transresistance amplifier. If the signal source shown in Fig. 2(b) is connected to the input of the transresistance amplifier, find its output voltage.

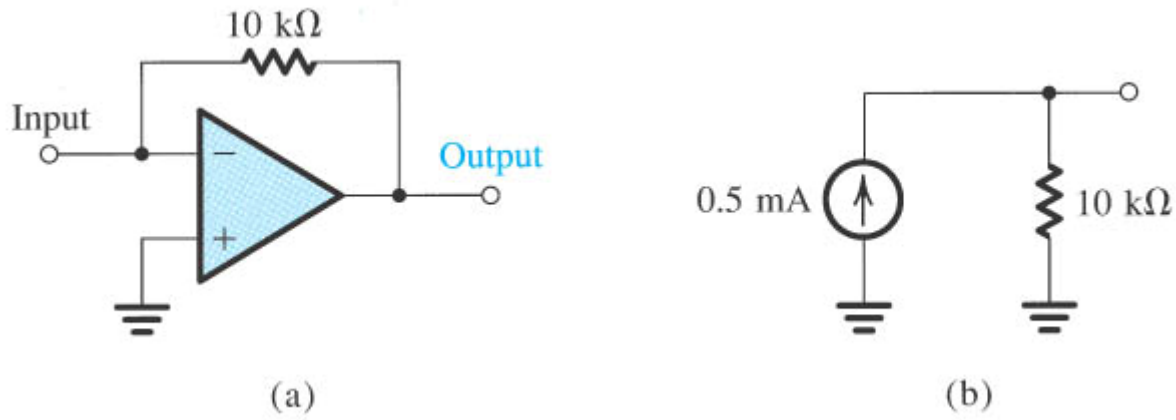

Fig. 2

3. An internally compensated op amp is specified to have an open-loop dc gain of 106 dB and a unity gain frequency of 3 MHz. Find f_{3dB} and the open-loop gain (in dB) at f_{3dB}. Also, find the open-loop dc gain at 300 Hz, 3 kHz, 12 kHz, and 60 kHz.

4. An op amp having a 106-dB gain at dc and a single-pole frequency response with f_t = 2 MHz is used to design a noninverting amplifier with nominal dc gain of 100. Find the 3-dB frequency of the closed-loop gain.