

Staple

07JAN08

EE241 Section 1111

CAPT Cameron

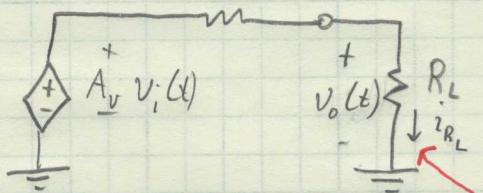
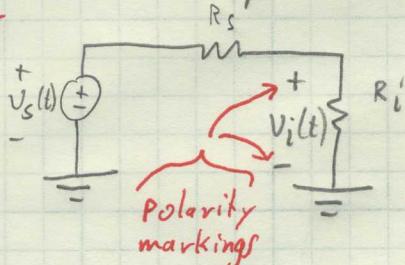
Date

Assignment Number { Assignment 1 (Example)

name

1. 3 (a) Find the input voltage v_i , the output voltage v_o , and the open-circuit voltage gain A_{vo} for this circuit.

Problem Number



State the problem in full.

Positive Current Direction

Solution By the voltage-divider rule { use English to explain your work.

$$v_i(t) = \frac{R_i}{R_s + R_i} v_s(t) \quad \boxed{\text{Boxed result}}$$

and

Solve problems algebraically. Leave arithmetic until the last (None is required for this problem).

$$v_o(t) = \frac{R_L}{R_o + R_L} A_v v_i(t)$$

$$v_o(t) = \frac{R_L}{R_o + R_L} \frac{R_i}{R_s + R_i} A_v v_s(t)$$

the open-circuit voltage gain can be found by removing R_L from the circuit.

$$\begin{aligned} A_{vo} &= \frac{A_v v_i(t)}{v_s(t)} \\ &= \frac{R_i}{R_s + R_i} A_v \frac{v_s(t)}{v_s(t)} \end{aligned}$$

$$A_{vo} = \frac{R_i}{R_s + R_i} A_v.$$

(b) What is the output current i_{R_L} ?

Solution $i_{R_L}(t) = \frac{v_o(t)}{R_L}$ by Ohm's law

$$i_{R_L}(t) = \frac{1}{R_o + R_L} \frac{R_i}{R_s + R_i} A_v v_s(t).$$

Use green engineering paper.