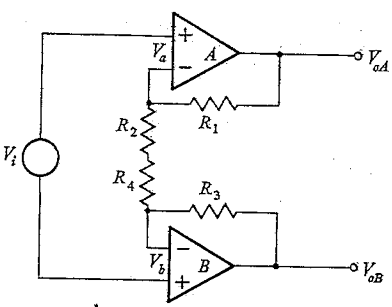
6-5 A DIDO system using two op amps is shown in the figure. DIDO stands for *differential input, differential output*. For minimizing offset and matching of parameters, the two op amps are fabricated on the same chip. Use $V_{oA} = A_{vA} V_a$ and $V_{oB} = A_{vB} V_b$. Prove, for this system,

(a) $A_v(\text{diff}) = \dfrac{V_{oA} - V_{oB}}{V_i} = \dfrac{A_{vA}}{1 + A_{vA}[(R_2 + R_4)/(R_1 + R_2 + R_3 + R_4)]}$

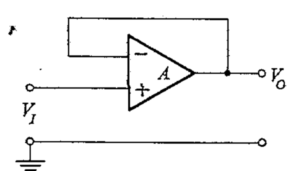
(b) $Z_i = \dfrac{V_i}{I_i} = 2R_{iA}(1 + A_{vA} K)$,

where $R_{iA} = R_{iB}$, $A_{vA} = A_{vB}$ and $K = (R_2 + R_4)/(R_1 + R_2 + R_3 + R_4)$.



Problem 6-5

6-6 The connection shown in the figure is referred to as a *voltage-follower* or *noninverting buffer*. Discuss the reasons why $V_O = V_I$, and comment upon the terminal impedance levels.



Problem 6-6

6-7 Show that when two parallel networks a and b are feeding ϵ in Fig. 6-8 from voltages V_{ia} and V_{ib}, the relation between output and input is

$$V_o = -\left[\frac{y_{21a}}{y_{21F}} V_{ia} + \frac{y_{21b}}{y_{21F}} V_{ib}\right].$$

6-8 Prove Eq. (6-21) for the bridged-T network.

6-9 Prove Eq. (6-22) for the twin-T network.

6-10 Prove Eq. (6-32) for inverting feedback.