

Concept Question 4-11: The expression given by Eq. (4.24) states that the gain of the inverting amplifier is independent of the magnitude of R_L . Would the expression remain valid if $R_L = 0$? Explain.

$$G = \frac{v_o}{v_s} = - \left(\frac{R_f}{R_s} \right)$$

The derivation leading to Eq. (4.24) assumes that the load resistance R_L is much larger than the op-amp's output resistance R_o . Setting $R_L = 0$ invalidates the assumption and invalidates Eq. (4.24).