Physics 116A Fall 2006 Assignment 8 Solutions
from Instructor's Manual for Fundamentals of Elec. Engr. 2nd Ed. by Bobrow
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9.41
ac-equivalent circuit: $R_p = 2M/2U = 1 \Omega$

$v_{sa} = 6V, I_{po} = 4mA, V_{cc} = 12V, I = 0.25mA, V_i = 2V$

$g_m = 2\sqrt{Kd} = 2\sqrt{(0.25)(1)} = 2 mA$

(vi) $v_x = -(2k)(2) = -4V$

(c) $R_p = 1M \Omega$

9.54 (a) For low frequencies:

(b) $w_1 = 3M \text{ rad/s}$

(c) $w_2 = 5.1 \text{ kHz}$

(c) $w_n = 15M \text{ rad/s}$ (2.07 MHz)
Note: You could just use the fact that the product of gain (with feedback) x BW = GBW product = 1 MHz

(a) \( A_F = 1/B = 10 \rightarrow BW = 1 \text{ MHz}/10 = 100 \text{ kHz} \)

(b) \( A_F = 1/B = 1.0 \times 10^3 \rightarrow BW = 1 \text{ MHz}/1.0 \times 10^3 = 1.0 \text{ kHz} \)