EECS 140 SPRING 96 MIDTERM 1
RW BRODERSEN

Use the following model parameters

Kp' = Kn' = 100 "mu" A/V^2
LAMBDAn = LAMBDAp = .02
GAMMAn = GAMMAp = 0
Vtn = Vtp = 1v

1a) Vt0
b) GAMMA
c) k'
d) LAMBDA

2)(W/L)mx

3a)Ids
b)Vout
c)Rin
   Rout
   Av

4)Vout, max
   Vout, min

5)Rl
   Rref

6)Iout/Iref

7)(W/L)m1
    (W/L)m2
    (W/L)m3
    (W/L)m4
    (W/L)m5
    R

8) Rout

9)Rout
   Av

1) Calculate LAMBDA, K', GAMMA, AND Vto Assuming that W/L =1 and 2PHI = 6V for

2)

(W/L)m1 = (W/L)m2 = (W/L)m3 = (W/L)m4 = (W/L)m5 = 10
What is the value fo (W/L)mx so that Vout has a DC coltage of 0V? (You don't ne

3)

a) What is Ids of m1?
b) What is the DC voltage at Vout?
c) If Ids(m1) = 10 "mu" A, what are Rin, Rout, and Av

4)

If Vin can vary from 0 - 5 V, what is the range of Vout?

5)

Calculate the values of Rl and Rref so that the DC voltage at Vout = 0V and the

6)

Assume all transistors have Vt=1V and Vdsat=.2V with LAMBDA= .1
What is the ratio Iout/Iref if Vo is at 0V?

7)

Choose the (W/L)'s and R so that the current source gives and Iout = 100 "mu" A

8)

What is Rout?

9)

a)What is Rout?
b) What is Av = Vout /(Vi^+ - Vi^-)?