Special Problem 4.6-7

The inductor in the circuit below is **unfathombly** large.

I have completed the **DC analysis** (so you **don't** have to)—I determined that V_{GS} =**6.0 V**, and **CHECKED** that the MOSFET is in **saturation**.

1. Now **you** determine and **carefully draw** the simplified **small-signal circuit** (be complete, clear, and precise!).

2. Analyze the small-signal circuit and determine the **small-signal voltage gain** ($A_v = v_o/v_i$) of the **amplifier** below.

Hints: Be **careful** when determining v_{gs}.

15.0 V   15.0 V

15.0 V

R_2=0.5 K

R_1=8 K

R_3=7 K

$v_o(t)$

K = 0.5 mA/V²
V_t=1.0 V
λ = 0.0 V⁻¹

R_4=6 K

$v_i(t)$