Find V_{gs}:

$$I_D = \frac{1}{2}\mu_n C_{ox}\left(\frac{W}{L}\right)(V_{gs} - \underbrace{V_{th}}_{0.7})^2(1 + \underbrace{\lambda V_{DS}}_{0}) = 1.31\,mA$$

$$1.31E\text{-}3 = \frac{1}{2}(1.34E\text{-}4)\left(\frac{50}{0.5}\right)(V_{gs} - 0.7)^2$$

meant to be V_{gs} →

$$0.0067\,V_{DS}^2 - 0.00938\,V_{DS} + 0.001973 = 0$$

$$\times\ V_{DS} = 1.142V \rightarrow V_{gs} = 1.142V$$

$$g_m = \sqrt{2\mu_n C_{ox}\left(\frac{W}{L}\right)I_D} = \sqrt{2 \cdot 1.34E\text{-}4\left(\frac{50}{0.5}\right)(1.31E\text{-}3)}$$

$$g_m = 0.00593 = 5.93\,E\text{-}3$$

$$A_V = -g_m R_D = -(5.93E\text{-}3)(2000) = -11.85\ V/V$$