Special Problem 3.3-8

The voltage source on the left side of the circuit below produces a d.c. voltage $V_s = 5.7$ V.

The voltage source on the right side of the circuit below produces a small a.c. signal $v_s(t)$.

The junction diode has an ideality factor of $n = 1.6$

Determine the small-signal voltage across the diode, in terms of small-signal voltage source $v_s(t)$.