Special Problem II.B-19

To operate properly, a certain **detector** requires an SNR of at least 10 dB, and an input signal power of greater than –50 dBm.

The compression (i.e., saturation) point of this detector is **unknown**.

This detector is attached to a receiver that has a **noise figure** of 3 dB.

The **input** compression point of the **receiver** is + 9 dBm

The **bandwidth** of the receiver IF filter is 10 MHz

The receiver AGC uses an attenuator whose value is adjustable between a **minimum** of 3dB of attenuation and a **maximum** of 50 dB of attenuation.

1) Determine the **minimum discernable signal** in dBm (assume T_A =290 K).

2) Determine the **gain** required by the receiver to adequately detect the MDS.

3) Determine what the compression point of the **detector** must be in order to accurately detect all signals within the total dynamic range of the receiver.