Special Problem 4.E-1

A **detector/demodulator** provides acceptable performance **only** if its input power is between **–60 dBm** and **–20 dBm**.

A receiver was designed, using this detector at the receiver output.

The receiver was **properly designed** by a knowledgeable radio engineer.

When the **adjustable attenuator** in the receiver is set to an attenuation of **0dB**, the **total gain** of the receiver is **40 dB**.

The **total dynamic range** of the receiver is **100 dB**.

a) Determine the **minimum power** of a signal at the **receiver input** (such that the signal can still be adequately **detected**).

b) Determine the **maximum power** of a signal at the **receiver input** (such that the receiver does not saturate).

c) If a signal with this **maximum** power **is** at the receiver input, determine the required **attenuation value** of the adjustable attenuator. Determine also the **total receiver gain** for situation.

d) Determine the **Instantaneous Dynamic Range** of the receiver.