Problem 1.1 :

If a transmitter produces 50 W of power, express the transmit power in units of a) dBm,b) dBW.

Problem 1.2 :

If 50 watts are transmitted by a unity gain antenna at 900 MHz carrier frequency, find the received power (assuming unity gain receiver antenna) in [dBm] and [W] at a free space distance of: a) 100 m from antenna b) 10 km from antenna.

Problem 1.3 :

A hypothetical isotropic antenna is radiating in free space. At a distance of 100 m from the antenna, the total electric field is measured to be 5 V/m.

a) Find the power density at this location.b) Determine the total power radiated by the antenna.

Problem 1.4 :

A dipole of length $3\lambda/2$ is resonant at f = 150 MHz. Calculate its mechanical length

a) in air   b) in water (ε_{rel} = 81).