

4

a) Eficiencia de la antena

Datos:

$$R_r = 72 \text{ ohms}$$

$$R_e = 8 \text{ ohms}$$

$$D = 20 \text{ dB}$$

$$P_{\text{ent}} = 100 \text{ W}$$

$$\eta = (R_r / (R_r + R_e)) \times 100$$

$$\eta = (72 / (72 + 8)) \times 100$$

$$\eta = (72 / 80) \times 100$$

$$[\eta = 90\%]$$

b)

$$\eta = 90\%$$

$$\eta = 10 \log(0,9)$$

$$\eta = -0,457$$

$$\text{dB}_i = \text{dB}_d - 2,16$$

$$\text{dB}_i = 19,51 - 2,16$$

$$[\text{dB}_i = 17,35]$$

$$G = D(\text{dB}) + N(\text{dB})$$

$$G = 20 \text{ dB} + (-0,457)$$

$$[G = 19,542 \text{ dB}]$$

(C) Potencia radiada en Watts, dBm y dBW

$$P_{rad} = \eta * P_{ent}$$

$$P_{rad} = (0,9) * 100W$$

$$[P_{rad} = 90 \text{ Watts}]$$

* En dBm

$$dBm = 10 \times \log_{10}(90) + 30$$

$$[dBm = 49,542]$$

$$* \text{ En dBW } \Rightarrow dBm - 30 \text{ o } 10 \log\left(\frac{W}{1}\right)$$

$$dBW \Rightarrow 10 \times \log_{10}(90) = [19,542 \text{ dBW}]$$

(d) EIRP

$$EIRP = P_{ent} * AP$$

$$D(\text{dB}) = 10 \log(D)$$

$$20 \text{ dB} = 10 \log(D)$$

$$10^{20/10} = D$$

$$D = 100$$

$$A_p = D * \eta$$

$$A_p = 100 * 0,9$$

$$A_p = 90$$

$$\text{EIRP} = P_{\text{ant}} * A_p$$

$$\text{EIRP} = 100 \text{ W} * 90$$

$$\text{EIRP} = \underline{9000 \text{ W}} = 9 \text{ kW}$$

- En Watts $\Rightarrow 9000 \text{ W}$

- En dBm $\Rightarrow 10 \times \log(9000) + 30$
dBm $\Rightarrow 69,542 \text{ dBm}$

- En dBW $\Rightarrow 69,542 - 30$

dBW $\Rightarrow 39,542 \text{ dBW}$