

Selected Answers to HW #7

Remember to explain all answers in your solutions. You will not receive credit for merely repeating an answer given here. When an answer is not given below, it is either because the solution is trivial or because disclosure of the answer would give away too much of the solution.

Although some effort has been made to ensure that there are no errors in the answers below, some might nevertheless appear. Please let me know as soon as possible if you discover an apparent error.

1. $R_{loss} = 0.14 \Omega$; $\xi = 97\%$; $R_{loss} = 0.070 \Omega$ for short dipole
2.
 - a. $S_{max} = 380 \text{ nW/m}^2$
 - b. $P_{RX} = 16 \text{ nW}$
3. $P_{RX} = 7.9 \text{ pW}$ to 1.8 nW
4. $P_{t,min} = 0.86 \text{ mW}$.
Some intermediate calculation results: For the RX antenna, $R_{loss} = 7.68 \text{ m}\Omega$ and $G_{RX} = 0.37$. Remember that you must show where these values come from.
5.
 - a. $A_e = 0.13\lambda^2$
 - b. $A_e = 0.12\lambda^2$
 - c. $A_e = 3.0\lambda^2$