1. Consider a parallel plate capacitor that being charges with a current I. (a) If the capacitance is C what is the potential difference as a function of time (b) What is the electric field as a function of time if the capacitor has area A and separation d. (c) compute the change in flux $d\phi_e/dt$

2. Consider an electric dipole antenna that transmits 1 W at 20 MHz. What is the signal intensity at 100 meter away (a) horizontally (b) vertically (c) at a 45 degree angle

3. Suppose the amplitude of an EM wave is 1 V/m. What is the (a) average intensity (b) radiation pressure

4. In class we discussed that the form $f(x - vt)$ and $f(x + vt)$ satisfies the wave equation. Show that $\cos(x)sin(vt)$ also satisfies the wave equation. How can $\cos(x)\sin(vt)$ be written in the form $f(x \pm vt)$?

5. In class, we discussed the idea of the solar sail. Here lets take it one step further. The US military is developing laser weapons in the megawatt range. Suppose I take it bit further and have a 100 megawatt laser. Also the laser is perfectly collimated so it does not spread with distance. I want to launch a perfectly reflective iPhone ($m = 0.1$ kg) to alpha centauri which is about 4 light-years $\approx 4 \times 10^{16}$ m away. If I shine the laser on the iPhone for about 1 month, (a) how long would it take to reach alpha centauri (ignore the acceleration phase). (b) how about if I shined it for 1 year. (c) what might be unrealistic about sending iPhones (or similarly small spacecraft) to Alpha Centauri