EECS 360
Homework #3

1. Section 2.6 Participation activities
   2.6.1: Energy or power signals?
   2.6.2: Energy or power or neither?
   2.6.3: Power and energy in sums of signals
2. Exercise 2.6.1
3. Exercise 2.6.3
4. In BPSK modulation a "1" bit is transmitted as $A\cos(2\pi f_c t)$ for a bit time T_b and a "0" bit as $-A\cos(2\pi f_c t)$ for a bit time T_b . Find the energy used to transmit a bit, E_b. Assume $f_c\ T_b$ is an integer, or $f_c\ T_b = k$ where k is an integer.
5. Find the power in $x_{RF}(t) = B\cos(2\pi f_m t)\cos(2\pi f_c t)$. Hint: $\cos(\alpha)\cos(\beta) = \frac{1}{2}(\cos(\alpha+\beta)+\cos(\alpha-\beta))$
6. Section 3.1 Participation activities
   3.1.1: Properties of square function.
   3.1.2: Linear or not?
   3.1.5: Is the system time invariant?
7. Exercise 3.1.1 a, b, e, g
8. A system defined by $y(t) = 3x(t) + 5$ is a linear system, TRUE or False.
9. Let $y(t) = x^2(t)$. Is this a linear system or nonlinear system. For $x(t)=A\cos(2\pi f_m t+\theta)$ find y(t). What frequencies are present in y(t)?