EE 451: Homework 1

1. #2.4 from textbook

2. #2.7 from textbook

3. #2.7 from textbook

4. #2.36 from textbook

5. Show that
$$\sum_{n=M}^{N} a^n = \begin{cases} \frac{a^M - a^{N+1}}{1-a} & a \neq 1 \\ N - M + 1 & a = 1 \end{cases}$$
(hint: expand the summation then multiply both sides by $1 - a$).

6. Write a MATLAB code to generate the sinusoidal sequence given by
$$x(n) = \cos(\omega_0 n)$$
for
   (a) $\omega_0 = 0$
   (b) $\omega_0 = 0.1\pi$
   (c) $\omega_0 = 0.2\pi$
   (d) $\omega_0 = 0.8\pi$
   (e) $\omega_0 = 0.9\pi$
   (f) $\omega_0 = \pi$
   (g) $\omega_0 = 1.1\pi$
   (h) $\omega_0 = 1.2\pi$

   use the stem function to plot your results and make sure you label all your figures.