KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF ELECTRICAL ENGINEERING

EE 422 Antenna Theory

Problem Session # 3

1. Using the array factor for a two element broadside array of point sources with equal amplitudes:

   a. Show that the maximum directivity expression is : $D_0 = \dfrac{2}{1+\dfrac{\sin kd}{kd}}$

   b. Plot the directivity as a function of d from 0 to 2 λ.

2. Problem 6.3 of your textbook
3. Problem 6.7 of your textbook.
4. Problem 6.9 of your textbook.
5.

   a. An array of 6 isotropic elements are placed along the z-axis a distance d = λ/4 apart. Assuming equal amplitudes and $\beta=0^0$, find the array factor, angles where the nulls of the pattern occur and angles where the maxima of the pattern occur. Sketch the array factor on a linear rectangular plot.

   b. Repeat when $\beta = 45^0$.