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## Sheet (5)

1. Estimate the relative field pattern (equation) of an array of two identical isotropic point sources in phase, spaced  $\lambda/2$  apart along the z axis. Then calculate the directivity.
2. Drive the relative field pattern (equation) of an array of two identical isotropic point sources in phase opposition, spaced  $\lambda/2$  apart along the z axis. Then calculate the directivity.
3. Derive an expression for  $E(\phi)$  for an array of 4 identical isotropic point sources arranged as in Fig. 1. The spacing  $d$  between each source and the center point of the array is  $3\lambda/8$ . Sources 1 and 2 are in-phase, and sources 3 and 4 in opposite phase with respect to 1 and 2.

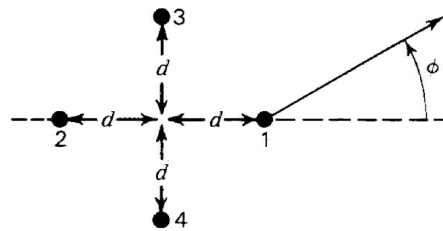


Figure 1

## REPORT

1. Show that the directivity for an array of two identical isotropic point sources in phase and spaced a distance  $d$  is given by

$$D = \frac{2}{1 + (\lambda/2\pi d) \sin(2\pi d/\lambda)}$$

*Good Luck*