Problem Solving
Set 12

15 July 2012

1. Let $n > 1$ be an odd positive integer and $A = (a_{ij})_{i,j=1,\ldots,n}$ be the $n \times n$ matrix with

$$a_{ij} = \begin{cases} 2 & \text{if } i = j \\ 1 & \text{if } i - j = \pm 2 \pmod{n} \\ 0 & \text{otherwise} \end{cases}$$

   Find $\det A$.

2. Show that
$$x^y + y^x > 1$$
   for all real $x, y > 0$