

Hints for homework # 2.

1. Consider the cross-section of the cone through its axis and a vertex of the cube.
2. Count occurrences of 1's and -1 's.
3. Replace each $\sin x$ by $(e^{ix} - e^{-ix})/2i$ and apply de Moivre's formula.
4. Differentiate both sides.
5. For a given π , the function $\pi(x)$ takes at most three different values.
6. Symmetry.
7. Transform into an upper- (or lower-) triangular determinant.
8. Easy!
9. Show that $\frac{x_{n-1}+x_{n+1}}{x_n}$ does not depend on n .
10. One solution is easy to find. Rule out other possibilities using divisibility arguments.
11. Straightforward.
12. How many times can a given pair (i, j) appear as one of (a_k, a_{k+1}) ?