

Due November 23, 2010

Name

Directions: Be sure to include in-line citations, including page numbers if appropriate, every time you use the results of discussion, a text, notes, or technology. **Only write on one side of each page.**

“The first mark of intelligence, to be sure, is not to start things; the second mark of intelligence is to pursue to the end what you have started.” – Panchatantra, c. 5th c.

Problems

1. Number 3 on page 93 of Judson: assuming that monoalphabetic code was used to encode the following secret message, what was the original message.
NBQFRSMXZF YAWJUFHWFF ESKGQCFWDQ AFNBQFTILO FCWP
2. Prove that an 2×2 matrix A with entries in \mathbf{Z}_{26} is invertible if and only if $\gcd(\det(A), 26) = 1$. Is the theorem still true for $n \times n$ matrices?
3. Number 9 on page 93 of Judson.
4. Number 10 parts a and d on page 93 of Judson.
5. Number 7 parts a and d on page 118 of Judson.
6. Number 15 parts a and d on page 120 of Judson.
7. Number 18 on page 120 of Judson: Let C be a linear code. Show that either the i th coordinates in the codewords of C are all zeros or exactly half of them are zeros.