

Problem 8 In the following, the elements φ of the group $\text{Aff}(2, \mathbb{Z}_{26})$ are used as bigram substitutions (Hill ciphers of order 2).

a) Determine, if possible, an element $\varphi \in \text{Aff}(2, \mathbb{Z}_{26})$ that transforms MUNICH into LONDON and an element $\psi \in \text{Aff}(2, \mathbb{Z}_{26})$ that transforms MUNICH into VIENNA.

b) How many elements $\varphi \in \text{Aff}(2, \mathbb{Z}_{26})$ transform JUNE into JULY ?

Due: Friday, April 29, 2005, 14:10 h