**Deciphering/Decryption**

The process of converting from cipher text to plain text is called deciphering.

The following example will explain the procedure for deciphering.

Example 6. Decipher the Cipher text = MOFZ for Key matrix = .

Solution: Recall the formula which we used for enciphering

C = KP (mod 26)

Formula for deciphering

P = (mod 26)

(mod 26)

Thus each plain text vector can be recovered from ciphertext vector by multiplying it on the left by (mod 26).

Step 1 First find , so

det(K) =

What is the inverse of 9 modulo 26? Let it be x, then 9x = 1(mod 26)

9.1 = 9 ≠ 1(mod26)

9.2 = 18 ≠ 1(mod26)

9.3 = 27 = 1(mod26)

Hence,

Therefore,

Step 2 Now, we will decipher MO first, then we will decipher FZ. For this we take

C = =

P = (mod 26) =(mod 26) =

Alphabets equivalent of the vector is

For FZ, C = =

and P = (mod 26)=

Alphabets equivalent of the vector is

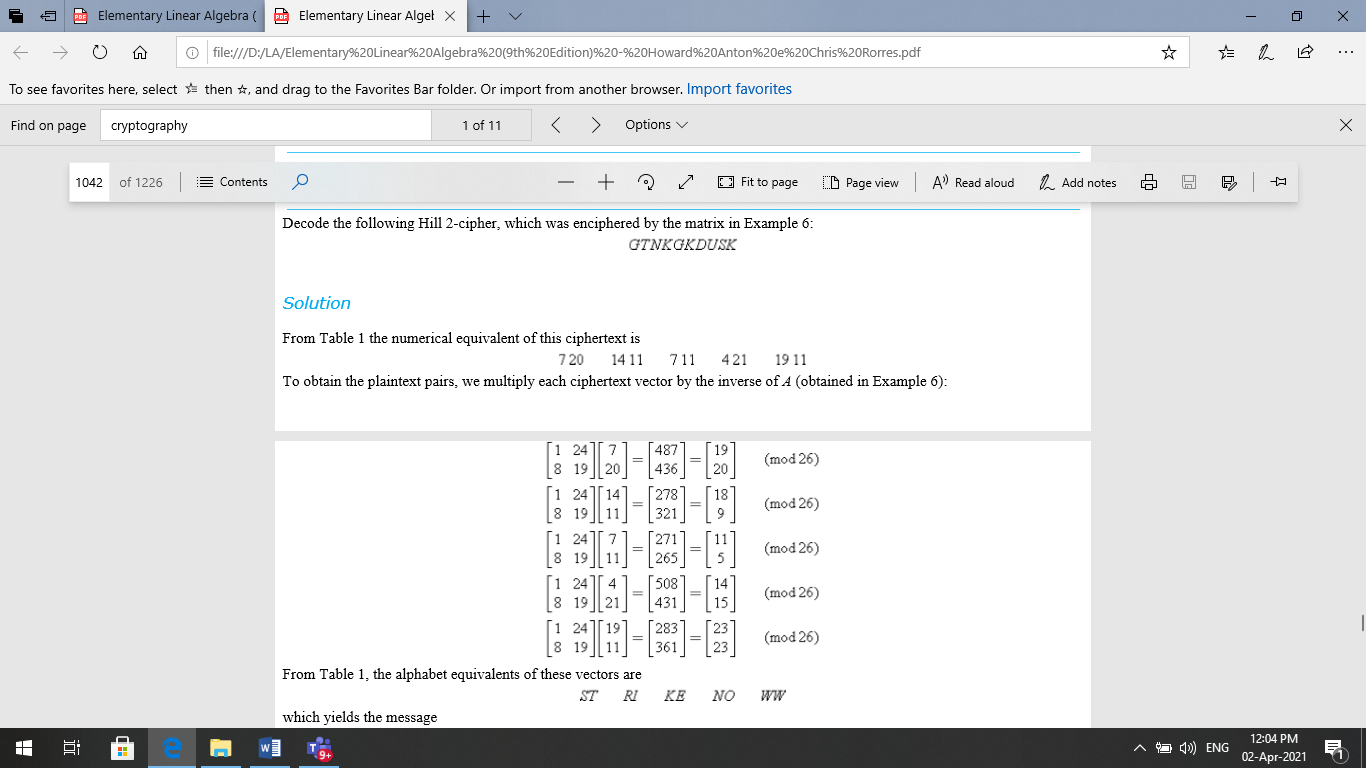
So all plain text is HELP.

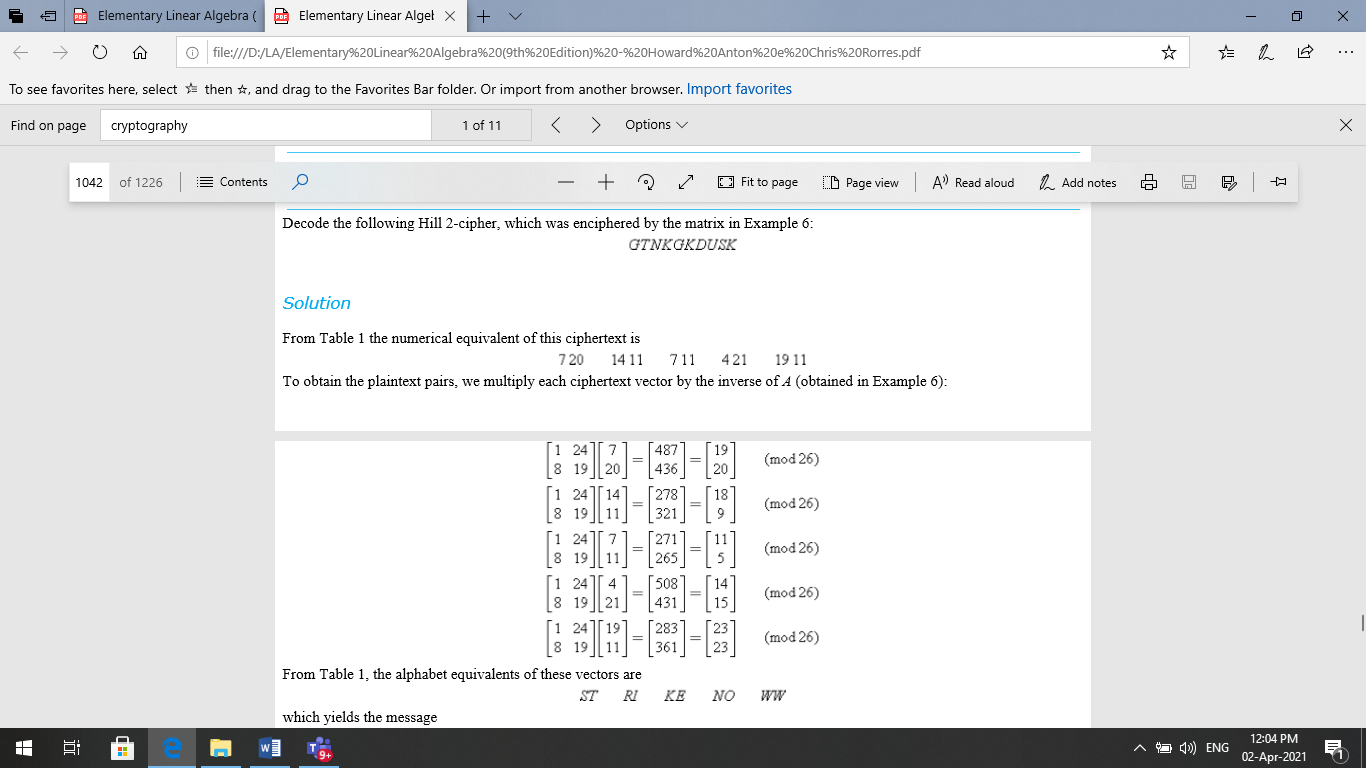
Example 7. Decode the following Hill 2-cipher, which was enciphered by the matrix

GTNKGKDUSK

Solution: We first find the inverse of K (mod 26) as

Next we write numerical equivalent of cipher text, which is





Which yields the message STRIKE NOW

**Example 8** Decode the Hill 3-cipher **XCVAFA** which was enciphered by the matrix key

**Solution:**

First we have to calculate the inverse of K

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Work to do

Question 1. Determine whether the matrix is invertible modulo 26. If so, find its inverse modulo 26 and check your work by

a) A= b) B = c) A=

Question 2.

Decode the following Hill 2-cipher which was enciphered by the matrix

SAKNOXAOJX

Question 3.

Decode the Hill 3-cipher **LQVGKE** which was enciphered by the matrix key

**Important Note:**

