

For problems #1-4, assume the following coding scheme:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

1. Encode **SAM** using  $M = \begin{pmatrix} 1 & 3 \\ 2 & 5 \end{pmatrix}$  as the encoding matrix.

2. Use the inverse of  $M$  to decode the message: 18, 54, 64, 166

3. Encode **ALGEBRA** using  $T = \begin{pmatrix} 1 & 2 \\ 2 & 5 \end{pmatrix}$  as the encoding matrix.

4. Use the inverse of  $T$  to decode: 22, 55, 14, 32, 35, 87, 52, 130.

Use the following coding scheme for problem #5 and tonight's homework.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
0	1	-1	2	-2	3	-3	4	-4	5	-5	6	-6	7	-7	8	-8	9
S	T	U	V	W	X	Y	Z	blank	!	.	?						
-9	10	-10	11	-11	12	-12	13	-13	14	-14	15	-15					

5. The message:  $-38,93,4,-7,29,-67,-51,121,20,-50,40,-98$  was encoded using the matrix  $M = \begin{pmatrix} 3 & -7 \\ 2 & -5 \end{pmatrix}$ .

(a) What matrix is needed to decode the message?

(b) What is the message?

### TONIGHT'S HOMEWORK

6. The message:  $6,12,-2,0,31,71,5,9,-13,-35,-44,-103$  was encoded using the matrix  $N = \begin{pmatrix} -1 & -2 \\ 2 & 5 \end{pmatrix}$ .

(a) What matrix is needed to decode the message?

(b) What is the message?

7. The message  $14,-50,-6,26,32,-115,17,-66,1,0,18,-59,-9,36,17,-64,-15,46$  was encoded using  $P = \begin{pmatrix} -2 & 7 \\ -1 & 4 \end{pmatrix}$ .

(a) What matrix is needed to decode the message?

(b) What is the message?