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Name: \_\_\_\_\_

MTH 1101

Applications of Algebra

Fall 2002

### QUIZ 4

**Instructions:** Put your name in the blanks above. Put your final answers to each question in the designated spaces on these pages. Show your work—if there is not enough room, use another sheet.

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(1) Find the inverse of the matrix  $A = \begin{bmatrix} 6 & -3 \\ 8 & -5 \end{bmatrix}$

(2) Given the system of equations 
$$\begin{cases} 4x + 5y = 3 \\ 2x + 3y = -1 \end{cases}$$

(a) Express the system in matrix form.

(b) Solve the system by using the inverse of the coefficient matrix.

(3) The message

20, 24, -28, -38, -11, -15

was encoded using the matrix

$$M = \begin{bmatrix} 3 & 4 \\ 1 & 1 \end{bmatrix}$$

and the coding scheme

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>	<i>J</i>	<i>K</i>	<i>L</i>	<i>M</i>	<i>N</i>	<i>O</i>	<i>P</i>
1	-1	2	-2	3	-3	4	-4	5	-5	6	-6	7	-7	8	-8
<i>Q</i>	<i>R</i>	<i>S</i>	<i>T</i>	<i>U</i>	<i>V</i>	<i>W</i>	<i>X</i>	<i>Y</i>	<i>Z</i>	blank	'	,	.	!	?
9	-9	10	-10	11	-11	12	-12	13	-13	14	-14	15	-15	16	-16

(a) What matrix is needed for decoding the message?

(b) What is the message?

The message is: \_\_\_\_\_