## Haigazian University MATH 219 Test 1 Page 1

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$$A = \begin{bmatrix} 3 & 4 \\ -1 & 6 \end{bmatrix} \quad and \quad B = \begin{bmatrix} -3 & 5 \\ 3 & 0 \end{bmatrix}$$

Calculate

$$tr(A)$$
,  $tr(B)$ ,  $tr(AB)$ ,  $tr(AA^T)$ 

2. A system of 3 equations in 3 unknowns  $\{x_1, x_2, x_3\}$  has the following augmented matrix

$$G = \begin{bmatrix} a & 0 & b & 2 \\ a & a & 4 & 4 \\ 0 & a & 2 & b \end{bmatrix}$$

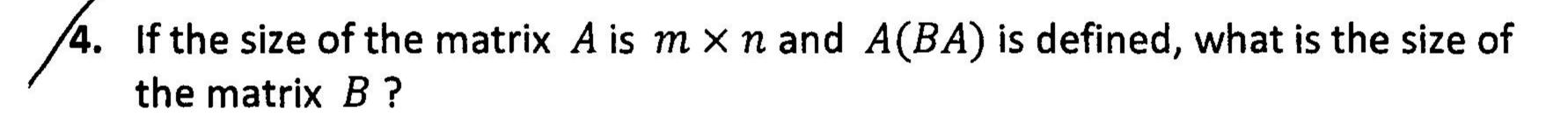
where a, b are given real numbers.

- If  $a \neq 0$ , find the reduced row-echelon form of G and solve the system.
- How many solutions does the system have if a = 0?

Use elementary row operations to find the inverse of the matrix

$$M = \begin{bmatrix} 1 & 2a & 10ac \\ 0 & 2 & 10c \\ 0 & 0 & 1 \end{bmatrix}$$

where a, c are given real numbers.



5. Given

$$\left(I_2 + \frac{1}{8}A\right)^{-1} = \begin{bmatrix} -1 & 2\\ -1/2 & 5 \end{bmatrix}$$

find A



Suppose A and A + B are both invertible, and let C be the inverse of A + B.

(I + BA<sup>-1</sup>)AC = I  
b) 
$$AC(I + BA^{-1}) = I$$