4) cauchy stress tensor 7 is a 3rg matrix that can fredict the force of a fluid pushing against a first surface. In particular if x=[x, x2, x3] represents the normal vector to a flat surface in 3D Space Such thati $11 \times 11 = \int_{x_1^2 + y_2^2 + x_3^2}^{2}$ is the area of the surface, then the matrix Multiplication Tx represents the force vector of that surface, i.e., f= 1x. suppose for a given fiuld configuration that the cauchy stress tensor is: 3 3 compute the force vector on a surface with normal (9) Vector X = [2; 1; 1] f = 1 x => f = 12 4 2 + 17 4 + S + 3 2+3+4

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(4)	suppose the force vector on an unknown surface is faction 17.
1	perive a 313 system of equations for the component x; of
	the normal vector to the unknown surface. Express your
	equations
	(i) in linear system notation,
	(x, +2x2 + x3 = 2
	2x1 + 5 x2 + 3x3 = 0
	x1 + 3x2 + 4x3 = 1
	(ii) in matrix-vector form
0	
	$\begin{bmatrix} 2 & 5 & 3 \\ 2 & 5 & 3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$
	[1 34] [1]
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	(iii) as an augmented matrix
	2 5 3 0
	1 3 4 1

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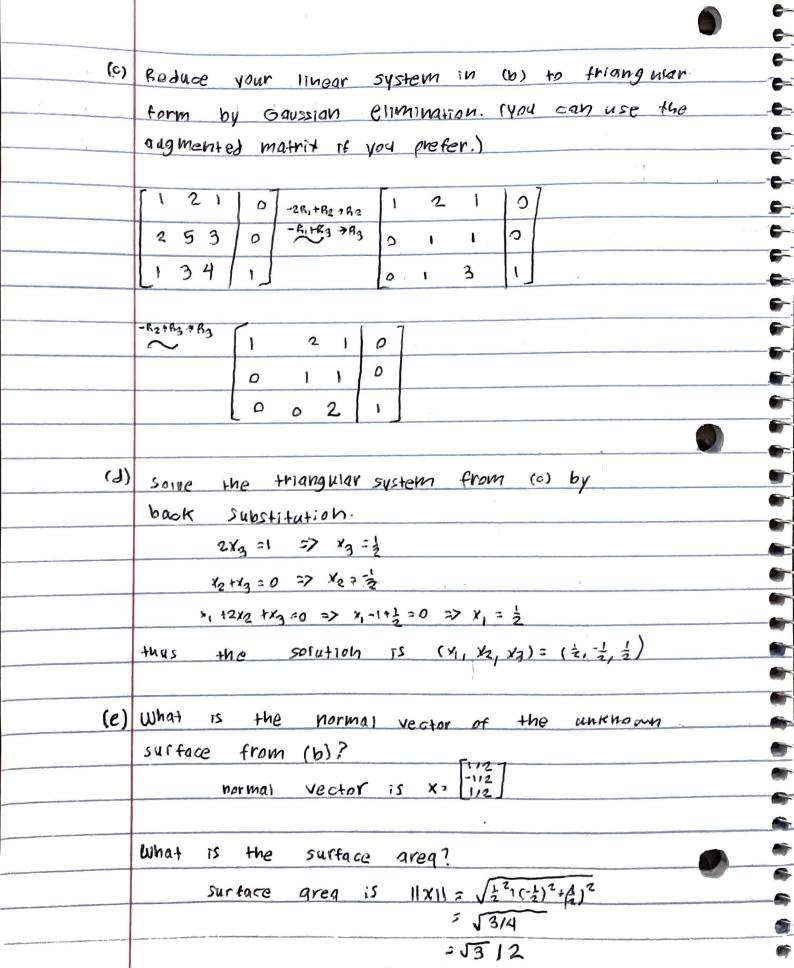
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