

1. In 1.1 #19, the augmented matrix was

$\text{Matrix}(\left[\left[\left[1, h, 4\right], \left[3, 6, 8\right]\right]\right)$

Note this is Maple notation - each row of the matrix is in brackets.

Eliminate the number 3 using Gaussian elimination. Which of the following are true:

- a) The Gaussian reduced matrix is  $\text{Matrix}(\left[\left[\left[1, h, 4\right], \left[0, 6-3h, -4\right]\right]\right)$
- b) The system is consistent for all  $h$
- c) The system is inconsistent for  $h = 2$
- d) a) and b)
- e) a) and c)



2. What is the solution to the system of equations represented

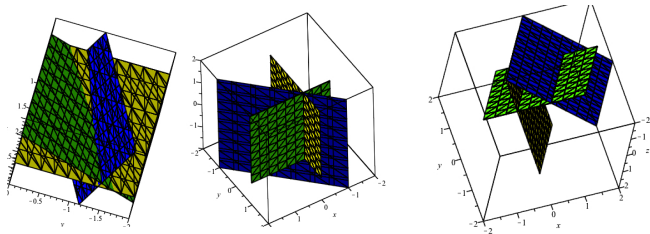
with this reduced augmented matrix  $\begin{bmatrix} 1 & 0 & 0 & 2 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 1 & 4 \end{bmatrix}$ ?

- a) (2,3,4)
- b) (1,1,1)
- c) There are an infinite number of solutions
- d) There are no solutions
- e) We can't tell without having the system of equations

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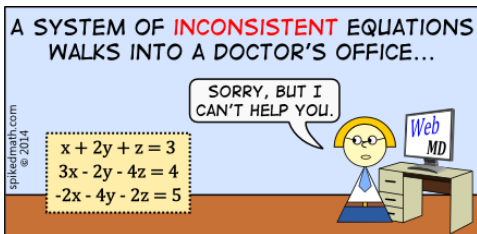
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3. If a linear system with 3 equations and 3 variables is inconsistent then we must have...

- a) at least 2 of the planes parallel
- b) a missing pivot for some  $x_i$
- c) some row in the reduced augmented matrix is  $[0 \ 0 \ 0 \ \text{nonzero}]$
- d) more than one of the above
- e) none of the above



<http://spikedmath.com/563.html>

4. How many solutions to a linear system of equations are possible?

- a) 0 or 1
- b) 0, 1, or 2
- c) 0, 1, 2 or infinite
- d) 0, 1, infinite
- e) any number of solutions is possible

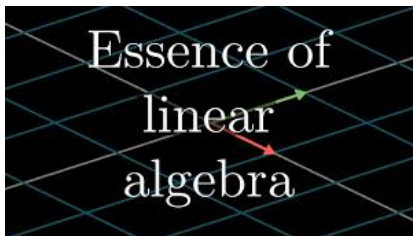
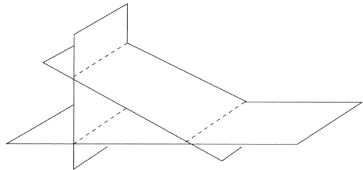


Image Credit: 3Blue1Brown

5. According to the language of linear algebra, this picture



- a) lies inside of  $\mathbb{R}^2$ , the  $x - y$  plane.
- b) shows 3 linear equations that have 3 lines as the solutions
- c) shows that 3 non-parallel planes do not have to have any points in common
- d) more than one of the above choices are possible



6. How can we geometrically represent the parametric equations  $(2t, -t + 1, t)$ ?

- a) a line in  $\mathbb{R}^2$
- b) a line in  $\mathbb{R}^3$
- c) a plane in  $\mathbb{R}^3$
- d) a volume in  $\mathbb{R}^3$
- e) other



<https://s3.amazonaws.com/tinycards/image/8522b72dee3570c7e69ddcf7d9e50119>



7. For a system of three linear equations in three variables, which of the following scenarios would always guarantee an infinite number of solutions?

- a) At least two of the equations represent the same plane.
- b) The three planes intersect along a line.
- c) The planes represented are parallel.
- d) More than one of the above choices are possible.
- e) None of the above

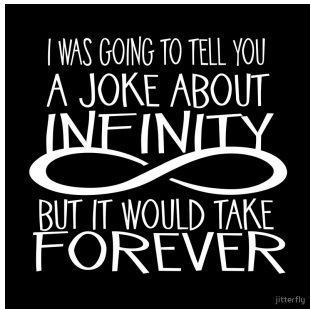


Image Credit: jitterfly

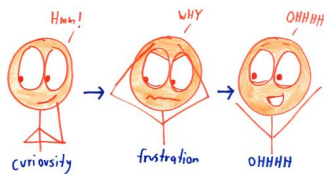


8. Use Gaussian on the following augmented matrix

$$\begin{bmatrix} 1 & 1 & 0 & 2 \\ 2 & 1 & 3 & 3 \\ 2 & 2 & h & 4 \end{bmatrix} ?$$

- a) it takes at least 3 elementary row operations to get to Gaussian here
- b) from Gaussian we can see that we have full pivots for all  $h$
- c) from Gaussian we can see that some  $h$  give us no solutions
- d) more than one of the above is true
- e) none of the above

The Mathematics Three-Step



9. For full credit, which of the following are true regarding graded problem sets:

- a) I am only allowed to use the book, my group members, the math lab and Dr. Sarah for help on the problem set.
- b) I can use any source for help, but the work and explanations must be distinguished as originating from my own group and I must acknowledge any help outside the group or Dr. Sarah, like “the idea for problem 1 came from discussions with Philip J. Fry or this website...”



<http://depts.washington.edu/womenctr/wordpress/wp-content/uploads/MC-Logo.png>

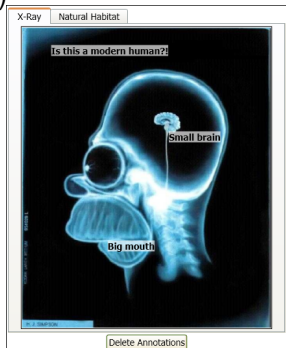


10. For full credit, which of the following are true regarding graded problem sets

- a) I must print out all work, including Maple ReducedRowEchelonForm commands and output
- b) I must annotate/explain my methods and reasoning with handwritten comments and/or typed comments.
- c) both a) and b)
- d) neither a) nor b)

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