**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**CAS MA242**

**Spring 20**

**Quiz A1 (Application Quiz): Systems of Linear Equations (D)**

This quiz will be scored “Pass” or “Not Passed Yet,” and you need to get most of the questions correct to pass. You may use Sage at <https://tinyurl.com/242SageCells> (or another CAS) but not other web pages.

Suppose that in a day you wish to eat 80g of protein, 250g of carbohydrates, and 65g of fat. Below is a table of foods with the number of grams of protein, carbohydrates, and fat per serving:

|  |  |  |  |
| --- | --- | --- | --- |
| **Food** | **Protein** | **Carbohydrates** | **Fat** |
| **Eggs** | 6 | 0 | 5 |
| **Rice** | 2 | 22 | 0 |
| **Cheese** | 7 | 0 | 9 |
| **Almonds** | 6 | 6 | 13 |
| **Tofu** | 8 | 2 | 4 |
| **Chocolate** | 2 | 15 | 10 |

1) Show that it is possible to get exactly your desired quantities of protein, carbohydrates, and fat by eating just eggs, rice, and cheese. About how many servings of each do you need to eat? Explain.

Note that you might find it helpful to use the A.rref().n() command in Sage, which converts fractions to decimals.

2a) Suppose you get bored of eating just eggs, rice, and cheese. If you add a serving of chocolate to your diet, how do you have to adjust the other three foods to maintain the desired quantities of protein, carbohydrates, and fat? Explain.

b) Suppose you add a serving of almonds to the original three foods. How do you have to adjust the other three foods to maintain the desired quantities of protein, carbohydrates, and fat? Explain.

3) Give two different examples of diets that include all six foods and that meet the desired quantities of protein, carbohydrates, and fat. Explain.

4) What are some problems with this model of nutrition and dieting?

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Pass Not Passed Yet