

Matrices

Practice Questions

Name: _____

Date: _____

Instructions

Attempt all questions. Show all necessary working and don't be a wazzock.

1. Given the matrices

$$A = \begin{pmatrix} 2 & 3 \\ 1 & 4 \end{pmatrix}, \quad B = \begin{pmatrix} 5 & 1 \\ 2 & 3 \end{pmatrix},$$

find

(a) $A + B$,

(b) $2A$,

(c) AB .

2. TUT can make only two meals: a **Chicken and Rice** and a **Chicken biryani**. The quantities of each ingredient used in each meal are given below.

	Chicken (g)	Rice (g)	Potato (g)	Olive Oil (g)
Chicken and Rice	150	100	0	10
Chicken Biryani	100	120	50	20

The nutritional values per gram of each ingredient are given below.

Ingredient	Calories (kcal/g)	Protein (g/g)
Chicken	1.65	0.31
Rice	1.30	0.027
Potato	0.35	0.024
Olive Oil	8.84	0

- (a) Write the quantities of ingredients used in the two meals as a 2×4 matrix Q .

- (b) Write the nutritional information as a 4×2 matrix N , where the first column represents calories and the second column represents protein.
- (c) Calculate the matrix product

$$QN.$$

- (d) Hence, state the total number of calories and the total amount of protein in each meal.

3. TUT collects his YouTube analytics from three groups of viewers: teenagers, adults, and autists.

Four videos receive the following average view percentage (as a decimal) from each group:

	Teenagers	Adults	Autists
The 7 Levels of Pure Mathematics	0.42	0.53	0.87
The 7 Levels of Math Symbols	0.56	0.44	0.71
How does 2TB fit in a microSD	0.46	0.61	0.69 HAHAHA
Ranking Every University Maths Course	0.39	0.43	0.47

YouTube estimates that his audience consists of

$$\begin{pmatrix} 0.20 \\ 0.25 \\ 0.45 \end{pmatrix}$$

teenagers, adults, and autists respectively.

- (a) Write the average view percentages as a 4×3 matrix R .
- (b) Explain why the audience proportions can be represented by a 3×1 matrix.
- (c) Calculate

$$R \begin{pmatrix} 0.20 \\ 0.25 \\ 0.45 \end{pmatrix}$$

- (d) Interpret the four entries of your answer.
- (e) Which video has the highest average view percentage?