Linear Algebra:

For linear algebra tasks, write your answers in physical papers in English, including the details of how you get the final answers.

Task 1:

Determine whether the following two vectors are parallel.

- (-2, 1, 3) and (4, 6, 1)
- (1, 2) and (-3, -6)
- (1, -2, 0, 1) and (3, 0, 2, -5)
- (10, 0, 2, -4, -8) and (5, 0, 1, -2, -4)

Task 2:

Find the equations of the planes containing the following points in space. If the provided points do not define a specific plane, justify your answer.

- (2, -5, -1), (0, 4, 6), and (-3, 7, 1)
- (1, 2, 1), (2, 4, 2), and (-3, -6, -3)
- (1, 1, 1), (2, 5, 2), and (0, 0, 0)

Task 3:

Answer the following questions.

- Write the zero vector of $M_{2x5}(\Re)$ where $\Re$ is the field of real numbers.
- We define $P(F)$ as the set of all polynomials with coefficients from field F.

  If $f(x) = 3.2x^2 + 2x - 0.5$, justify that if f belong to $P(\aleph)$ where $\aleph$ is the field of natural numbers.

Task 4:

Label the following statements as true or false, give a counterexample if you labeled false.

- If f and g are polynomials of degree n, then $f + g$ is polynomial of degree n.
- An $m \times n$ matrix has n columns and m rows.
- In any vector space V, if $x, y \in V$, then $ax = ay$ implies that $x = y$.

WeHelp

Assignment - Week 1

Python:

For Python tasks this week, write all code without third-party libraries in a single program where we can execute it and get all the expected outputs at once.

Task 1:

Parse the items of ASUS PCs which are shown on the following URL.
https://24h.pchome.com.tw/store/DSAA31

We should parse all the items shown on every page and we should assume we don't know how many pages are there in advance.

Create a file named products.txt and print product IDs, 1 per line.

Task 2:

Based on the data we parsed in Task 1. Create a file named best-products.txt and print product IDs with at least 1 review where average rating greater than 4.9

Task 3:

Based on the data we parsed in Task 1. Calculate the average price of ASUS PCs with Intel i5 processor. Just print it in the console.

Task 4:

We want to use z-score to standardize the prices of ASUS PCs where you can treat parsed data in Task 1 as statistical population.

Create a file named standardization.csv and print data as the following format.

```
ProductID,Price,PriceZScore
ProductID,Price,PriceZScore
...
```