TNSL20 - Final Exam

This is a final exam for MATLAB part of the TNSL20 course.

You are allowed to use:

- All lab material
- Previously written code
- Internet

Not allowed:

- Communication of any kind (email, chat, discussion, phones or other mobile devices, etc.)
- Information from your neighbour's display

The exam goes during the whole class without the break. Late submissions will not be graded.
All mobile devices should be off and away.
To pass the course you need to correctly solve at least 2 tasks.
Please, submit all your MATLAB codes (.m files) to your teacher in a single email.

Good luck!

1 Task 1

Create a program that for a given vector `v` creates a new vector `a` with negative elements of `v`. Make sure that your code works with any `v`.

For example, for the following vector `v`:

```
v = [-65, 10, 101, 0, -1, 55, -21, -200];
```

The resulting vector `a` should be `[-65, -1, -21, -200]`.

2 Task 2

Create a program that for a given vector `v` prints all pairs of elements from this vector where the first number is greater than the second number. Make sure that your program works with any `v`.

For example, for the vector `v = [1, 4, 2, 9]` the program output should be (order does not matter):

```
4 1
4 2
2 1
9 1
9 4
9 2
```

3 Task 3

Write a program that for a given matrix `A` creates a new matrix `B` of the same size with elements from `A` divided by 10. Make sure that your code works with any matrix `A`.

For example, for the input matrix

```
A = [
    10, 20, 40;
    30, 10, 50;
    90, 60, 70
];
```

The resulting matrix `B` should be:

```
B = [
    1, 2, 4;
    3, 1, 5;
    9, 6, 7
];
```

4 Task 4

Create a program that prints the first three columns of the matrix `A`, separating columns with a line of symbols "#". Make sure that your program works with any matrix `A` (with more than 3 columns).

For example, for the input matrix

```
A = [
    10, 20, 21, 64;
    30, 10, 56, 15;
    50, 60, 75, 84
];
```

The program output should be:

```
    10
    30
    50

##################
    20
    10
    60

##################
    21
    56
    75
```

5 Task 5

Write a program that creates a vector with 10 random numbers and finds the maximum element in the vector.