

Informatics 1, 3rd midterm (2019-12-09)

The answers should fit next to the questions, if you use a separate paper let us know clearly!

Name: _____

Neptun: _____

1	2	3	4	5	6	Σ

MatLab

1. What is the result of the following commands?
(5 points)

a) `size(5)`

b) `diag(1:3, 1)`

c) `ones(4, 1)*ones(1, 3)`

d) `2.^(0:4)`

e) `mod((0:4)'+(0:4), 5)`

2. Write a matlab function that returns the matrix X where the first two columns are swapped from matrix M !
(2 points)

```
function X = swap(M)
```

```
end
```

3. Plot the function $x \cdot \sin(x)$ with `plot` on the interval $[-2\pi, 2\pi]$ with a step size 0.1
(3 points)

Sage

4. What is the result of the following commands?

(4 points)

a) `5//4`

b) `expand((1+x)^3)`

c) `(3^30)%2`

d) `[n^2 for n in range(5)]`

5. Solve the equation $f'(x) = 0$ with parameters a, b, c .

$$f(x) = ax^2 + bx + c$$

Mind the definition of symbolic variables! *(3 points)*

6. Calculate the following limit (with sage)! *(3 points)*

$$\lim_{x \rightarrow 0} \left(e^{-\frac{1}{x^2}} \right)''$$