

LabWork #3

MAT 116E-Advanced Scientific and Engineering Computing (MATLAB)

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Task 1

Plot the following vectors:

```
>> x=linspace(1,4,4)
>> y=logspace(1,4,4)           % Plot y with respect to x
>> z1=rand(1,25)               % Plot z1
>> z2=randn(1,25)              % Plot z2
>> z1Floor=floor(3+5*z1)
>> z1Round=round(3+5*z1)
>> z1Ceil=ceil(3+5*z1)
>> % Plot z1, z1Floor, z1Round, z1Ceil in the same figure
```

What can you say and do for all plots?

NOTE: You can close all figures by `close all` command.

Task 2

The special set of $n \times n$ real symmetric positive semidefinite matrices, denoted by \mathbf{S}_+^n is called a convex cone. Consider the special case \mathbf{S}_+^2 . For a symmetric matrix

$$A = \begin{bmatrix} x & y \\ y & z \end{bmatrix}$$

the conditions $y^2 \geq xz$ and $x + z \geq 0$ makes A to be a positive semi-definite matrix. Plot the boundary of the corresponding convex cone, i.e.

$$y^2 = xz \text{ where } x \geq 0 \text{ and } z \geq 0$$

in xyz space using MATLAB.

NOTE: You can use `view([45 45 10])` command to adjust the azimuth, elevation and skew of the plot, respectively.

Submission Information

Any LabWork submitted after class will be subject to a 20-point deduction per 24 hour period. Extensions should be requested at least 3 days in advance and will only be granted for exceptional reasons (e.g., conference submission). You may work with your friends. Collaboration is strongly recommended. However, each student should be able to present his/her program.