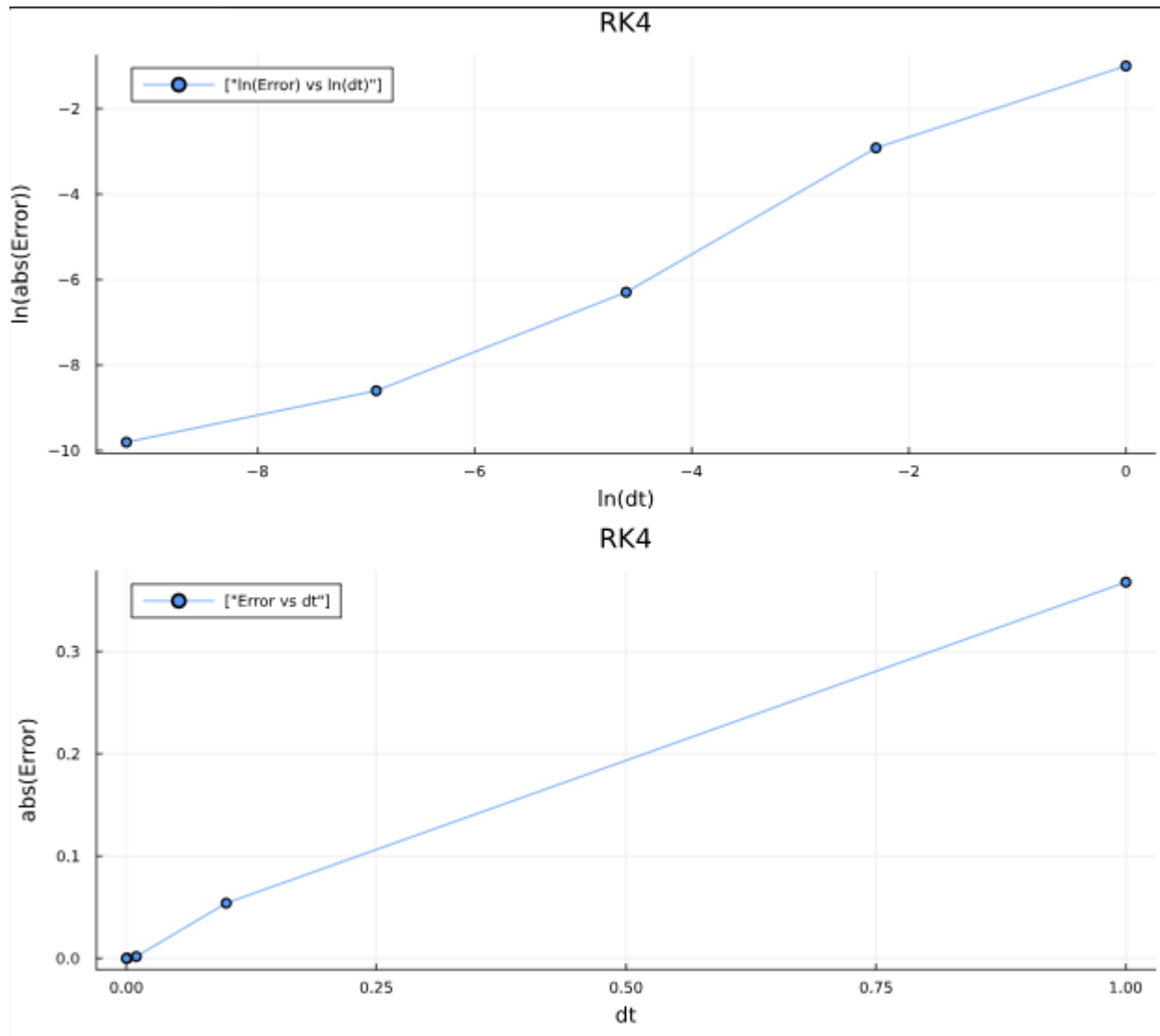


Tut1_Pictures

1

Exact value is $\exp(-1)$

Simple Euler



```
For time: 1.0    x(1): 0.0
For time: 0.1    x(1): 0.31381059609
For time: 0.01   x(1): 0.3660323412732295
For time: 0.001  x(1): 0.36769542477096373
For time: 0.0001 x(1): 0.36782426032828575
Actual answer is: 0.36787944117144233
```

○ julia> █

For time: 1.0 x(1): 0.0

For time: 0.1 x(1): 0.31381059609

For time: 0.01 x(1): 0.3660323412732296

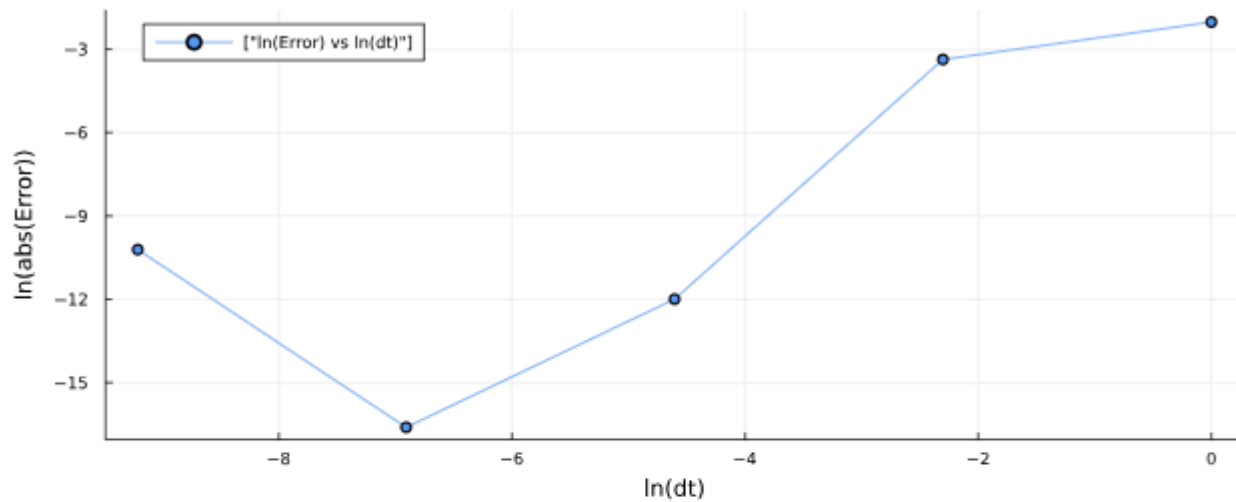
For time: 0.001 x(1): 0.36769542477096373

For time: 0.0001 x(1): 0.36782426032828575

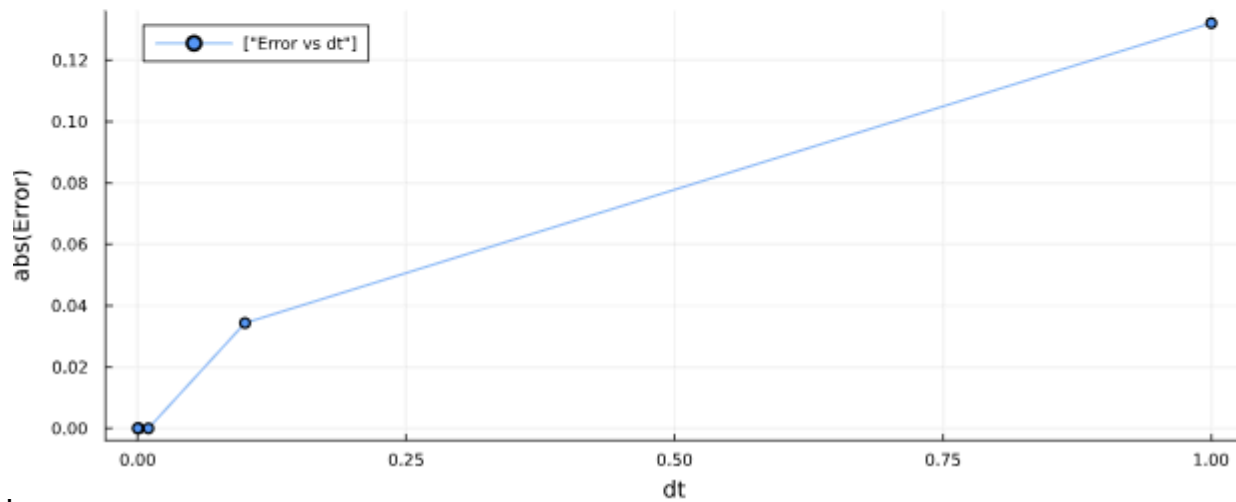
Actual answer is: 0.36787944117144233

Improved Euler

Improved Euler



Improved Euler



```
For time: 1.0 x(1): 0.5
For time: 0.1 x(1): 0.33352959127436443
For time: 0.01 x(1): 0.367885618716192
For time: 0.001 x(1): 0.36787950253069096
For time: 0.0001 x(1): 0.3678426556798375
Actual answer is: 0.36787944117144233
```

julia

For time: 1.0 x(1): 0.5

For time: 0.1 x(1): 0.33352959127436443

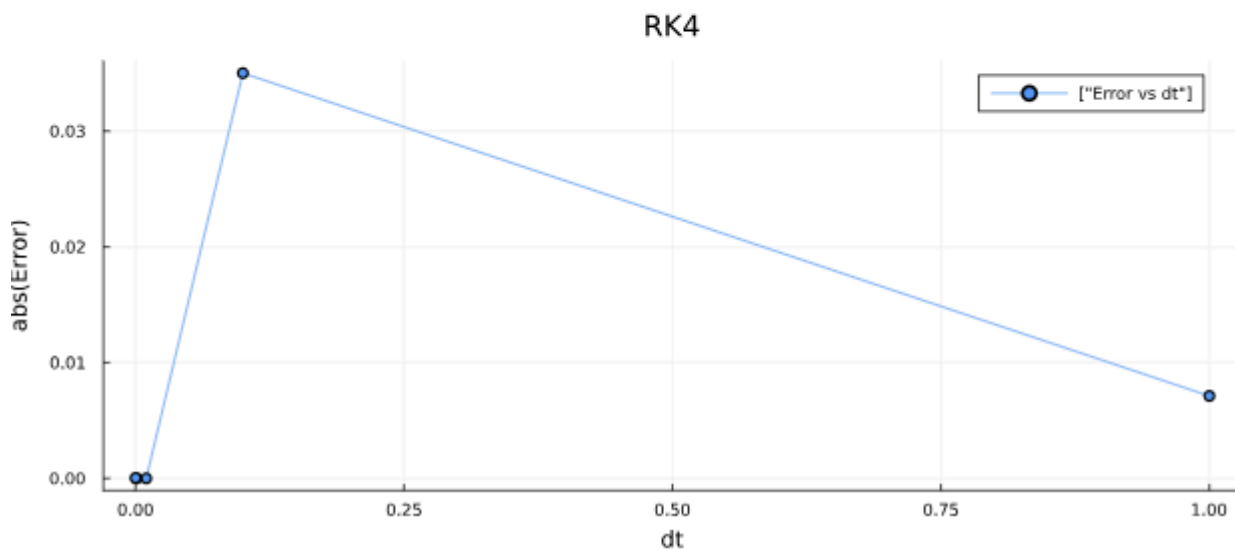
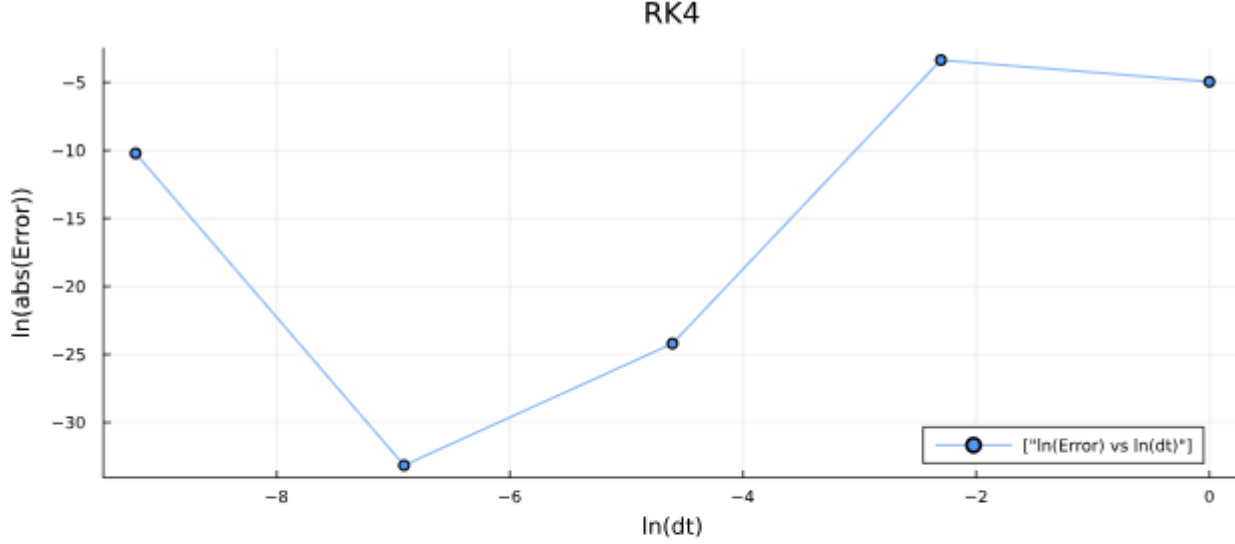
For time: 0.01 x(1): 0.367885618716192

For time: 0.001 x(1): 0.36787950253069096

For time: 0.0001 x(1): 0.3678426556798375

Actual answer is: 0.36787944117144233

Rk4



```

For time: 1.0 x(1): 0.375
For time: 0.1 x(1): 0.332871415379969
For time: 0.01 x(1): 0.3678794412023554
For time: 0.001 x(1): 0.36787944117144633
For time: 0.0001 x(1): 0.36784265506666375
Actual answer is: 0.36787944117144233

```

○ julia> █

For time: 1.0 x(1): 0.375

For time: 0.1 x(1): 0.332871415379969

For time: 0.01 x(1): 0.3678794412023554

For time: 0.001 x(1): 0.36787944117144633

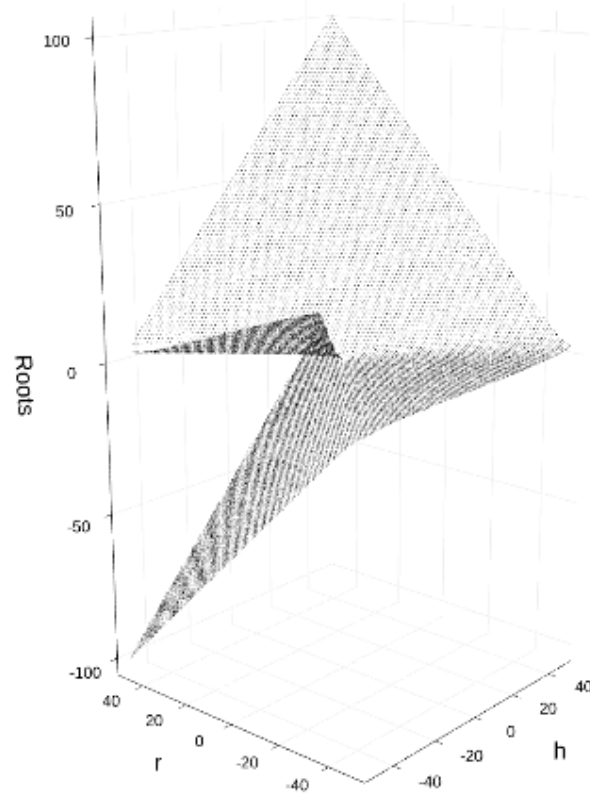
For time: 0.0001 x(1): 0.36784265506666375

Actual answer is: 0.36787944117144233

2

Below is the Catastrophe surface

Catastrophe Surface



The interactive HTML can be found in the github repo

Heatmap corresponds to the number of fixed points

