The solution is

The condition number of this solution at is , which is stable if is reasonable.

From class notes, we know that Euler’s method is stable if , in this case, and . Hence, , hence **euler’s forward is NOT stable.**

Performing one iteration of euler’s forward method:

In this case, , and , and

Hence,

For the given ODE, we know that backward Euler is stable if

Hence, **backward Euler is stable**.

Performing one iteration of backward Euler, we have: