

We want at least that the approx. solution follows the trend of the exact one!

For the practically meaningful case  $\lambda < 0$  we demand the approx. solution decreases in magnitude:

$$|y_{j+1}| < |y_j| \quad (\text{Absolute stability})$$

or simply  
A-stability (AS)

So with  $y_{j+1}$  (SF)

$$|y_{j+1}| = |g(z) y_j| = |g(z)| |y_j| < |y_j|$$

we get a requirement on the SF

$$|g(z)| < 1$$

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This motivates the following definition