12.7

$$y'(t) = \lambda y(t)$$

$$f(t, y(t)) = y'(t) = \lambda y(t)$$

metoda jawna :

$$y_{n+1} = y_n + h \, f(t_n, y_n)$$

$$y_{n+1} = y_n + h \cdot y'(t_n)$$

$$y_{n+1} = y_n + h \cdot \lambda y_n$$

$$y_{n+1} = y_n (1 + h\lambda)$$

$$y_n \to 0 \quad \text{goly} \qquad |1 + h\lambda| < 1$$

$$-1 < 1 + h\lambda < 1$$

$$-\frac{2}{\lambda} > h > 0 \quad \longleftarrow (bo\ \lambda < 0)$$

metoda niejawna :

$$y_{n+1} = y_n + h \cdot f(t_{n+1}, y_{n+1})$$

$$y_{n+1} = y_n + h\lambda y_{n+1}$$

$$y_{n+1} (1 - \lambda h) = y_n \qquad /\cdot (1 - \lambda h)$$

$$y_{n+1} = y_n \cdot \frac{1}{1 - \lambda h}$$

$$y_n \to 0 \quad \text{goly} \qquad \left| \frac{1}{1 - \lambda h} \right| < 1$$