$\{-1, 0, 1\}$

$y' - y = 0$

$\lambda = 1$ – нечетн

$k = 4$

$$\Lambda_h = \frac{1}{h}\left[-\frac{1}{2}y(x-h) + 0\cdot y(x) + \frac{1}{2}y(x+h)\right] - \frac{1}{6}y(x-h) - \frac{2}{3}y(x) - \frac{1}{6}y(x+h)$$

$$\Delta_h = \frac{1}{h^4}\left[\frac{2}{5!}\left(\frac{1}{2}\cdot 1\right) - \frac{2}{4!}\left(\frac{1}{6}\cdot 1\right)\right]y^{(5)}(x)$$

$$\begin{cases} a_1 \cdot 1^1 = \frac{1^1}{2} \\ b_0 = 1 - 2b_1 \\ \frac{a_1 \cdot 1^{1+2}}{(1+2)!} = \frac{b_1 \cdot 1^2}{2!} \end{cases}$$

$$\begin{cases} a_1 = \frac{1}{2} \\ b_0 + 2b_1 = 1 \\ \frac{1}{6}a_1 - \frac{1}{2}b_1 = 0 \end{cases}$$

$$\begin{cases} a_1 = \frac{1}{2} \Rightarrow a_{-1} = -\frac{1}{2};\ a_0 = 0 \\ b_0 = 1 - 2b_1 = 1 - \frac{1}{3} = \frac{2}{3} \\ b_1 = \frac{1}{6}a_1 \cdot 2 = \frac{1}{6} \Rightarrow b_1 = \frac{1}{6} \end{cases}$$

$\{-2,-1,0,1,2\}$

$y^{(4)}(x) - g(x) = 0$

$n=4$ – сетка

$k=?$

$$\Delta_h = \frac{1}{h^4}\left[y(x-2h) - 4y(x-h) + 6y(x) - 4y(x+h) + y(x+2h)\right] + \frac{1}{720}g(x-2h) - \frac{31}{180}g(x-h) - \frac{79}{120}g(x) - \frac{31}{180}g(x+h) + \frac{1}{720}g(x+2h)$$

$$\Delta_h = \frac{1}{h^6}\left[\frac{2}{10!}\left(-4\cdot 1^{10} + 1\cdot 2^{10}\right) - \frac{2}{6!}\left(\frac{31}{180}\cdot 1^6 + \frac{-1}{720}\cdot 2^6\right)\right]\cdot y^{(10)}(x)$$

$$= \frac{1}{h^6}\cdot y^{(10)}(x)\cdot\left[\frac{1}{3024}\right]$$

$$\begin{cases} a_0 + 2a_1 + 2a_2 = 0 \\ a_1\cdot 1^2 + a_2\cdot 2^2 = 0 \\ a_1\cdot 1^4 + a_2\cdot 2^4 = \frac{4!}{2} \\ b_0 = 1 - 2b_1 - 2b_2 \end{cases}$$

неизвестных:
$a_0\ a_1\ a_2\ b_0\ b_1\ b_2$ – 6,
уравнений – 4 =>
=> еще 2 уравнения =>
=> $m = 2, 4 \Rightarrow m_{max} = 4 = k-2 \Rightarrow$
$\Rightarrow \boxed{k=6}$

$$\frac{a_1\cdot 1^{4+2} + a_2\cdot 2^{4+2}}{(4+2)!} = \frac{b_1\cdot 1^2 + b_2\cdot 2^2}{2!}$$

$$\frac{a_1\cdot 1^{4+4} + a_2\cdot 2^{4+4}}{(4+4)!} = \frac{b_1\cdot 1^4 + b_2\cdot 2^4}{4!}$$

$$\begin{cases} a_0 + 2a_1 + 2a_2 + 0 + 0 + 0 = 0 \\ 0 + a_1 + 4a_2 + 0 + 0 + 0 = 0 \\ 0 + a_1 + 16a_2 + 0 + 0 + 0 = \frac{4!}{2} \\ 0 + 0 + 0 + b_0 + 2b_1 + 2b_2 = 1 \\ 0 + \frac{1}{6!}a_1 + \frac{2^6}{6!}a_2 + 0 - \frac{1}{2}b_1 - \frac{4}{2}b_2 = 0 \\ 0 + \frac{1}{8!}a_1 + \frac{2^8}{8!}a_2 + 0 - \frac{1}{4!}b_1 - \frac{2^4}{4!}b_2 = 0 \end{cases}$$

$a_0 = 6$ $\quad b_0 = \frac{79}{120}$

$a_{-1} = a_1 = -4$ $\quad b_{-1} = b_1 = \frac{31}{180}$

$a_{-2} = a_2 = 1$ $\quad b_{-2} = b_2 = \frac{-1}{720}$

$\frac{4!}{2} = \frac{4\cdot 3\cdot 2}{2} = 12$

$\frac{1}{6!} = \frac{1}{720}$

$\frac{2^6}{6!} = \frac{4}{45}$

$\frac{1}{8!} = \frac{1}{40320}$

$\frac{2^8}{8!} = \frac{2}{315}$

$\frac{1}{4!} = \frac{1}{24}$

$\frac{2^4}{4!} = \frac{2\cdot 2\cdot 2}{4\cdot 3\cdot 2}$