**Задачи по теме “Численное решение краевой задачи”**

 **Задача 1.** Методом конечных разностей найти решение краевой задачи

 

с шагами ,  и оценить погрешность по правилу Рунге. Построить графики полученных приближенных решений.

######  Таблица к задаче 1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| № |  |  |  |  |  |  |  |
| 1 | 0.6 | 2.6 | 15cos(*x*) | 0 | 1 | 0 | -2 |
| 2 | 0.7 | 4 |  | 0 | 1 | 0 | 4 |
| 3 | 0.4 | 5 |  | 1 | 2 | 0 | -4 |
| 4 | 1 | 7 |  | 1 | 2 | 3 | 0 |
| 5 | 0.8 | 4 |  | 0 | 1 | 8 | 4 |
| 6 | 0.6 | 12 |  | 2 | 3 | 2 | 6 |
| 7 | 0.3 | 0.6*x* | 8sin(*x*) | 1 | 3 | 2 | 2 |
| 8 | 0.3*x* | 5 |  | 1 | 2 | 0 | -2 |
| 9 |  | 6 |  | 0 | 1 | 7 | 2 |
| 10 | 0.2 | 3*x* |  | 1 | 2 | 1 | 6 |
| 11 |  | 5x | 10 | 0 | 1 | -2 | 2 |
| 12 | 1.2 |  |  | 0 | 1 | -3 | 2 |
| 13 | 0.8 | 8cos(x) |  | 1 | 2 | 0 | 5 |
| 14 | 0.4 | 6 |  | 0 | 1 | 1 | 2 |
| 15 | 0.7 | 3 |  | 3 | 4 | 3 | 0 |
| 16 | 1.4 | 2.4 | -14cos(*x)* | 1 | 2 | 0 | 2 |
| 17 | 1.4 | 7 |  | 2 | 3 | 1 | 1 |
| 18 | 0.6 | 3 |  | 0 | 1 | 3 | 0 |
| 19 | sin(*x*) | 6 | -5 | 1.5 | 3 | -3 | 1 |
| 20 | *x*+3 | 5 |  | 1 | 2 | 2 | 3 |
| 21 | 0.2*x* | 5 |  | 0 | 1 | 0 | 0 |
| 22 | 0.2 |  |  | -1 | 1 | 1 | 2 |
| 23 | 0.4 | 4cos(2x) |  | 1 | 2 | 0 | 5 |
| 24 | 0.6 |  |  | 0 | 1 | 2 | 3 |
| 25 | 0.2*x* | 1.8 | 2sin(*x*-4) | 1 | 3 | 1 | 1 |
| 26 | 0.5 | 5*x* |  | 0 | 1.2 | 1 | 3 |
| 27 |  | 6 | 15-5*x* | -1 | 1 | 6 | 2 |

 Окончание таблицы к задаче 1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 28 |  | 6 | 13 | 0 | 1 | 3 | 1 |
| 29 | 1.6 | 3.6cos(x-1) | -10 | 1 | 2 | 0 | 8 |
| 30 | 0.3 |  |  | 1 | 2 | 1 | 1 |