Solution of differential equations

The objectives of the task: Strengthen the skills of solution of the boundary problems by Runge-Kutta method.

Task Requirements: Solve the following boundary problem on the interval [0; 5] by Runge-Kutta method.

Instructions for performing:

1. Transform the equation to the system. - 0.6 points
2. Form the function calculation system. - 0.6 points
3. Solve the system of differential Equations. - 0.6 points
4. Output a graphic solution. - 0.6 points
5. Available Comments - 0.6 points.

Maximum evaluation are **3 points**

You need to create a script file with a graphic solution. Make a scan the graphic solution. Send me the script file and the scan of the graphic solution

Criteria for evaluation: Available Comments, no mistakes.

Variants of tasks.

1. $\frac{d^2x}{dt^2} - 6\frac{dx}{dt} + 9x = 0, x(0) = 2, \frac{dx}{dt}(0) = 0$
2. $\frac{d^2x}{dt^2} + 2\frac{dx}{dt} + x = 0, x(0) = 0, \frac{dx}{dt}(0) = 1.5$
3. $\frac{d^2x}{dt^2} - 4x = 0, x(0) = 1, \frac{dx}{dt}(0) = 3$
4. $\frac{d^2x}{dt^2} - 4\frac{dx}{dt} + 5x = 0, x(0) = 1, \frac{dx}{dt}(0) = 0.5$
5. $\frac{d^2x}{dt^2} + 4\frac{dx}{dt} = \cos t, x(0) = 0, \frac{dx}{dt}(0) = 0$
6. $\frac{d^2x}{dt^2} - 8\frac{dx}{dt} + 16x = 3 + t,$
   $x(0) = 0, \frac{dx}{dt}(0) = 0$
7. $\frac{d^2x}{dt^2} + 9\frac{dx}{dt} = 2\cos 3t + \sin 3t,$
   $x(0) = 0, \frac{dx}{dt}(0) = 0$
8. $\frac{d^2x}{dt^2} - 8\frac{dx}{dt} + 7x = 2 - 16x + 7x^2,$
   $x(0) = 0, \frac{dx}{dt}(0) = 0$
9. $\frac{d^2x}{dt^2} + 2\frac{dx}{dt} + 5x = 10\cos x,$
   $x(0) = 0, \frac{dx}{dt}(0) = 0$
10. $\frac{d^2x}{dt^2} - x = 0, x(0) = 1.5, \frac{dx}{dt}(0) = 5$
11. $\frac{d^2x}{dt^2} + 15x = -1, x(0) = 0, \frac{dx}{dt}(0) = 0$
12. $\frac{d^2x}{dt^2} - 8\frac{dx}{dt} + 16x = t + \sin 4t,$
    $x(0) = 0.2, \frac{dx}{dt}(0) = 0$
13. $\frac{d^2x}{dt^2} - 6\frac{dx}{dt} + 8x = 5e^2x^2,$
    $x(0) = 0, \frac{dx}{dt}(0) = 1.2$
14. $\frac{d^2x}{dt^2} - 4\frac{dx}{dt} + 8x = \sin 2t,$
    $x(0) = 0, \frac{dx}{dt}(0) = 0.5$
15. $\frac{d^2x}{dt^2} - 3\frac{dx}{dt} + 2x = e^x, x(0) = 3, \frac{dx}{dt}(0) = 0$