

3.5. Вычислить определенный интеграл $F = \int_{x_0}^{x_1} y dx$, методами прямоугольников, трапеций, Симпсона с шагами h_1, h_2 . Оценить погрешность вычислений, используя Метод Рунге-Ромберга:

$$1. \quad y = \frac{x}{2x+5}, \quad X_0 = -1, \quad X_k = 1, \quad h_1 = 0.5, \quad h_2 = 0.25;$$

$$2. \quad y = \frac{x}{(3x+4)^2}, \quad X_0 = 0, \quad X_k = 4, \quad h_1 = 1.0, \quad h_2 = 0.5;$$

$$3. \quad y = \frac{x}{(3x+4)^3}, \quad X_0 = -1, \quad X_k = 1, \quad h_1 = 0.5, \quad h_2 = 0.25;$$

$$4. \quad y = \frac{3x+4}{2x+7}, \quad X_0 = -2, \quad X_k = 2, \quad h_1 = 1.0, \quad h_2 = 0.5;$$

$$5. \quad y = \frac{1}{(2x+7)(3x+4)}, \quad X_0 = -1, \quad X_k = 1, \quad h_1 = 0.5, \quad h_2 = 0.25;$$

$$6. \quad y = \frac{x}{(2x+7)(3x+4)}, \quad X_0 = -1, \quad X_k = 1, \quad h_1 = 0.5, \quad h_2 = 0.25;$$

$$7. \quad y = \frac{1}{3x^2+4x+2}, \quad X_0 = -2, \quad X_k = 2, \quad h_1 = 1.0, \quad h_2 = 0.5;$$

$$8. \quad y = \frac{1}{x^2+4}, \quad X_0 = -2, \quad X_k = 2, \quad h_1 = 1.0, \quad h_2 = 0.5;$$

$$9. \quad y = \frac{x}{x^2+9}, \quad X_0 = 0, \quad X_k = 2, \quad h_1 = 0.5, \quad h_2 = 0.25;$$

$$10. \quad y = \frac{x^2}{x^2+16}, \quad X_0 = 0, \quad X_k = 2, \quad h_1 = 0.5, \quad h_2 = 0.25;$$

$$11. \quad y = \frac{1}{x^3+64}, \quad X_0 = -2, \quad X_k = 2, \quad h_1 = 1.0, \quad h_2 = 0.5;$$

$$12. \quad y = \frac{x}{x^3+8}, \quad X_0 = -1, \quad X_k = 1, \quad h_1 = 0.5, \quad h_2 = 0.25;$$

$$13. \quad y = \frac{x^2}{x^3-27}, \quad X_0 = -2, \quad X_k = 2, \quad h_1 = 1.0, \quad h_2 = 0.5;$$

$$14. \quad y = \frac{1}{x^4+16}, \quad X_0 = 0, \quad X_k = 2, \quad h_1 = 0.5, \quad h_2 = 0.25;$$

$$15. \quad y = \frac{x}{x^4+81}, \quad X_0 = 0, \quad X_k = 2, \quad h_1 = 0.5, \quad h_2 = 0.25;$$

$$16. \quad y = \frac{x^2}{x^4+256}, \quad X_0 = 0, \quad X_k = 2, \quad h_1 = 0.5, \quad h_2 = 0.25;$$

$$17. \quad y = \frac{1}{256-x^4}, \quad X_0 = -2, \quad X_k = 2, \quad h_1 = 1.0, \quad h_2 = 0.5;$$

18. $y = \frac{x}{16-x^4},$ $X_0 = -1, \quad X_k = 1, \quad h_1 = 0.5, \quad h_2 = 0.25;$
19. $y = \frac{x^2}{625-x^4},$ $X_0 = 0, \quad X_k = 4, \quad h_1 = 1.0, \quad h_2 = 0.5;$
20. $y = \frac{\sqrt{x}}{4+3x},$ $X_0 = 1, \quad X_k = 5, \quad h_1 = 1.0, \quad h_2 = 0.5;$
21. $y = \frac{\sqrt{x}}{(1+2x)^2},$ $X_0 = 1, \quad X_k = 5, \quad h_1 = 1.0, \quad h_2 = 0.5;$
22. $y = x\sqrt{2x+3},$ $X_0 = -1, \quad X_k = 1, \quad h_1 = 0.5, \quad h_2 = 0.25;$
23. $y = \frac{1}{\sqrt{(2x+7)(3x+4)}},$ $X_0 = 0, \quad X_k = 4, \quad h_1 = 1.0, \quad h_2 = 0.5;$
24. $y = \sqrt{16-x^2},$ $X_0 = -2, \quad X_k = 2, \quad h_1 = 1.0, \quad h_2 = 0.5;$
25. $y = x\sqrt{49-x^2},$ $X_0 = -2, \quad X_k = 2, \quad h_1 = 1.0, \quad h_2 = 0.5;$
26. $y = x^2\sqrt{36-x^2},$ $X_0 = 1, \quad X_k = 5, \quad h_1 = 1.0, \quad h_2 = 0.5;$
27. $y = \sqrt{9+x^2},$ $X_0 = 1, \quad X_k = 5, \quad h_1 = 1.0, \quad h_2 = 0.5;$
28. $y = x^3\sqrt{4+x^2},$ $X_0 = 1, \quad X_k = 5, \quad h_1 = 1.0, \quad h_2 = 0.5;$
29. $y = \sqrt{x^2-36},$ $X_0 = 6.5, \quad X_k = 8.5, \quad h_1 = 0.5, \quad h_2 = 0.25;$
30. $y = x^3\sqrt{x^2-49},$ $X_0 = 7.5, \quad X_k = 9.5, \quad h_1 = 0.5, \quad h_2 = 0.25;$