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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

18.
$$y = \frac{x}{16 - x^4}$$
,

$$X_0 = -1$$
, $X_k = 1$, $h_1 = 0.5$, $h_2 = 0.25$;

19
$$y = \frac{x^2}{625 - x^4}$$
,

$$X_0 = 0$$
, $X_k = 4$, $h_1 = 1.0$, $h_2 = 0.5$;

$$20. y = \frac{\sqrt{x}}{4+3x},$$

$$X_0 = 1$$
, $X_k = 5$, $h_1 = 1.0$, $h_2 = 0.5$;

21.
$$y = \frac{\sqrt{x}}{(1+2x)^2}$$
,

$$X_0 = 1$$
, $X_k = 5$, $h_1 = 1.0$, $h_2 = 0.5$;

$$22. y = x\sqrt{2x+3},$$

$$X_0 = -1$$
, $X_k = 1$, $h_1 = 0.5$, $h_2 = 0.25$;

23.
$$y = \frac{1}{\sqrt{(2x+7)(3x+4)}}$$
,

$$X_0 = 0$$
, $X_k = 4$, $h_1 = 1.0$, $h_2 = 0.5$;

24.
$$y = \sqrt{16 - x^2}$$
,

$$X_0 = -2$$
, $X_k = 2$, $h_1 = 1.0$, $h_2 = 0.5$;

25.
$$y = x\sqrt{49 - x^2}$$
,

$$X_0 = -2$$
, $X_k = 2$, $h_1 = 1.0$, $h_2 = 0.5$;

26.
$$y = x^2 \sqrt{36 - x^2}$$
,

$$X_0 = 1$$
, $X_k = 5$, $h_1 = 1.0$, $h_2 = 0.5$;

27.
$$y = \sqrt{9 + x^2}$$
,

$$X_0 = 1$$
, $X_k = 5$, $h_1 = 1.0$, $h_2 = 0.5$;

28.
$$y = x^3 \sqrt{4 + x^2}$$
,

$$X_0 = 1$$
, $X_k = 5$, $h_1 = 1.0$, $h_2 = 0.5$;

29.
$$y = \sqrt{x^2 - 36}$$
,

$$X_0 = 6.5$$
, $X_k = 8.5$, $h_1 = 0.5$, $h_2 = 0.25$;

30.
$$y = x^3 \sqrt{x^2 - 49}$$
,

$$X_0 = 7.5$$
, $X_k = 9.5$, $h_1 = 0.5$, $h_2 = 0.25$;