

$$20.7. \int_0^1 (x^2 - 3x + 4) dx.$$

$$20.14. \int_0^1 (4x + 3)3^x dx.$$

$$20.21. \int_0^1 (1 - 5x^2 + 5x) dx.$$

$$20.28. \int_0^1 (5x + 2)4^x dx.$$

$$20.8. \int_0^1 (6x - 5)2^x dx.$$

$$20.15. \int_0^1 (x^2 - 4x + 4) dx.$$

$$20.22. \int_0^1 (6x + 5)3^x dx.$$

$$20.29. \int_0^1 (5x^2 - 4x + 1) dx.$$

$$20.9. \int_0^1 (4 - 2x^2 - x) dx.$$

$$20.16. \int_0^1 (6x - 1)3^x dx.$$

$$20.23. \int_0^1 (4x^2 - 6x - 1) dx.$$

$$20.30. \int_0^1 (-x + 5)3^x dx.$$

$$20.10. \int_0^1 (-5x + 6)3^x dx.$$

$$20.17. \int_0^1 (5 - 6x^2 - 5x) dx.$$

$$20.24. \int_0^1 (-5x + 2)2^x dx.$$

$$20.31. \int_0^1 (-x^2 + 2x + 3) dx.$$

$$20.11. \int_0^1 (-6x^2 + 2x + 4) dx.$$

$$20.18. \int_0^1 (2x + 5)2^x dx.$$

$$20.25. \int_0^1 (3x^2 - 3x + 1) dx.$$

$$20.32. \int_0^1 (2x + 1)4^x dx.$$

$$20.12. \int_0^1 (-5x + 1)5^x dx.$$

$$20.19. \int_0^1 (3x^2 + x - 1) dx.$$

$$20.26. \int_0^1 (-3x + 1)3^x dx.$$

$$20.13. \int_0^1 (2x^2 - x + 4) dx.$$

$$20.20. \int_0^1 (6x - 3)2^x dx.$$

$$20.27. \int_0^1 (3x^2 + 4x - 3) dx.$$

Задача 21. Найти пределы.

$$21.1. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n \sin(\pi(3 + \frac{k}{n}))}{n}.$$

$$21.9. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 2 \operatorname{arctg}(5 + \frac{4k}{n})}{n}.$$

$$21.17. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 4 \cos(6 + \frac{8k}{n})}{n}.$$

$$21.25. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 2 \operatorname{arctg}(8 + \frac{6k}{n})}{n}.$$

$$21.2. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 5 \cos(\pi(2 + \frac{5k}{n}))}{n}.$$

$$21.10. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n \ln(3 + \frac{2k}{n})}{n}.$$

$$21.18. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 2\sqrt{5 + \frac{6k}{n}}}{n}.$$

$$21.26. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n \ln(6 + \frac{5k}{n})}{n}.$$

$$21.3. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 2\sqrt{7 + \frac{4k}{n}}}{n}.$$

$$21.11. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 5 \sin(\pi(3 + \frac{5k}{n}))}{n}.$$

$$21.19. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n \operatorname{arctg}(10 + \frac{3k}{n})}{n}.$$

$$21.27. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 4 \operatorname{arctg}(7 + \frac{12k}{n})}{n}.$$

$$21.4. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 5 \operatorname{arctg}(2 + \frac{5k}{n})}{n}.$$

$$21.12. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 2 \cos(\pi(3 + \frac{2k}{n}))}{n}.$$

$$21.20. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n \ln(5 + \frac{k}{n})}{n}.$$

$$21.28. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 4 \sin^2(1 + \frac{4k}{n})}{n}.$$

$$21.5. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 2 \ln(5 + \frac{4k}{n})}{n}.$$

$$21.13. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n \sqrt{3 + \frac{2k}{n}}}{n}.$$

$$21.21. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n \sin(9 + \frac{3k}{n})}{n}.$$

$$21.29. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 4 \ln(5 + \frac{8k}{n})}{n}.$$

$$21.6. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 5 \sin(\pi(1 + \frac{5k}{n}))}{n}.$$

$$21.14. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 3 \operatorname{arctg}(\frac{6k}{n} - 1)}{n}.$$

$$21.22. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 3 \cos(2 + \frac{6k}{n})}{n}.$$

$$21.30. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n (3 + \frac{k}{n}) \sin(3 + \frac{k}{n})}{n}.$$

$$21.7. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n \cos(\pi(1 + \frac{k}{n}))}{n}.$$

$$21.15. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 3 \ln(7 + \frac{9k}{n})}{n}.$$

$$21.23. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 4\sqrt{\frac{8k}{n} + 3}}{n}.$$

$$21.31. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 2(1 + \frac{2k}{n}) \cos(1 + \frac{2k}{n})}{n}.$$

$$21.8. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 3\sqrt{1 + \frac{6k}{n}}}{n}.$$

$$21.16. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n \sin(6 + \frac{2k}{n})}{n}.$$

$$21.24. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 2 \cos(3 + \frac{6k}{n})}{n}.$$

$$21.32. \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n 3(1 + \frac{3k}{n})e^{1 + \frac{3k}{n}}}{n}.$$

Задача 22. Вычислить определенные интегралы.

$$22.1. \int_{-2}^0 (x^2 + 5x + 6) \cos 2x dx.$$

$$22.11. \int_0^{2\pi} (3 - 7x^2) \cos 2x dx.$$

$$22.21. \int_1^2 x \ln^2 x dx.$$

$$22.2. \int_{-2}^0 (x^2 - 4) \cos 3x dx.$$

$$22.12. \int_0^{2\pi} (1 - 8x^2) \cos 4x dx.$$

$$22.22. \int_1^{e^2} \frac{\ln^2 x dx}{\sqrt{x}}.$$

$$22.3. \int_{-1}^0 (x^2 + 4x + 3) \cos x dx.$$

$$22.13. \int_{-1}^0 (x^2 + 2x + 1) \sin 3x dx.$$

$$22.23. \int_1^8 \frac{\ln^2 x dx}{\sqrt[3]{x^2}}.$$

$$22.4. \int_0^{\pi} (9x^2 + 9x + 11) \cos 3x dx.$$

$$22.14. \int_0^3 (x^2 - 3x) \sin 2x dx.$$

$$22.24. \int_0^1 (x + 1) \ln^2(x + 1) dx.$$

$$22.5. \int_{-4}^0 (x^2 + 7x + 12) \cos x dx.$$

$$22.15. \int_0^{\pi} (x^2 - 3x + 2) \sin x dx.$$

$$22.25. \int_2^3 (x - 1)^3 \ln^2(x - 1) dx.$$

$$22.6. \int_0^{\pi} (2x^2 + 4x + 7) \cos 2x dx.$$

$$22.16. \int_0^{\frac{\pi}{2}} (x^2 - 5x + 6) \sin 3x dx.$$

$$22.26. \int_{-1}^0 (x + 2)^3 \ln^2(x + 2) dx.$$

$$22.7. \int_{-2}^0 (x + 2)^2 \cos 3x dx.$$

$$22.17. \int_{-3}^0 (x^2 + 6x + 9) \sin 2x dx.$$

$$22.27. \int_0^2 (x + 1)^2 \ln^2(x + 1) dx.$$

$$22.8. \int_0^{2\pi} (3x^2 + 5) \cos 2x dx.$$

$$22.18. \int_0^{\frac{\pi}{4}} (x^2 + 17.5) \sin 2x dx.$$

$$22.28. \int_1^e \sqrt{x} \ln^2 x dx.$$

$$22.9. \int_0^{\pi} (8x^2 + 16x + 17) \cos 4x dx.$$

$$22.19. \int_0^{\frac{\pi}{2}} (1 - 5x^2) \sin x dx.$$

$$22.29. \int_{-1}^1 x^2 e^{-\frac{x}{2}} dx.$$

$$22.10. \int_0^{2\pi} (2x^2 - 15) \cos 3x dx.$$

$$22.20. \int_0^3 (3x - x^2) \sin 2x dx.$$

$$22.30. \int_0^1 x^2 e^{3x} dx.$$

$$22.31. \int_{-2}^0 (x^2 + 2) e^{\frac{x}{2}} dx.$$

Задача 23. Вычислить определенные интегралы.

$$23.1. \int_{e+1}^{e^2+1} \frac{1+\ln(x-1)}{x-1} dx.$$

$$23.2. \int_0^1 \frac{(x^2+1)dx}{(x^3+3x+1)^2}.$$

$$23.3. \int_0^1 \frac{4 \operatorname{arctg} x - x}{1+x^2} dx.$$

$$23.4. \int_0^2 \frac{x^3 dx}{x^2+1}.$$

$$23.5. \int_{\pi}^{2\pi} \frac{x+\cos x}{x^2+2 \sin x} dx.$$

$$23.6. \int_0^{\frac{\pi}{4}} \frac{2 \cos x + 3 \sin x}{(2 \sin x - 3 \cos x)^3} dx.$$

$$23.7. \int_0^{\frac{1}{2}} \frac{8x - \operatorname{arctg} 2x}{1+4x^2} dx.$$

$$23.8. \int_1^4 \frac{\frac{1}{(2\sqrt{x})} + 1}{(\sqrt{x}+x)^2} dx.$$

$$23.9. \int_0^1 \frac{x dx}{x^4+1}.$$

$$23.10. \int \frac{\sqrt{8} x + \frac{1}{x}}{\sqrt{x^2+1}} dx.$$

$$23.11. \int \frac{\sqrt{8} x - \frac{1}{x}}{\sqrt{x^2+1}} dx.$$

$$23.12. \int_0^{\sqrt{3}} \frac{\operatorname{arctg} x + x}{1+x^2} dx.$$

$$23.13. \int_0^{\sqrt{3}} \frac{x - (\operatorname{arctg} x)^4}{1+x^2} dx.$$

$$23.14. \int_0^1 \frac{x^3}{x^2+1} dx.$$

$$23.15. \int_0^{\sin^{-1} 1} \frac{(\operatorname{arcsin} x)^2 + 1}{\sqrt{1-x^2}} dx.$$

$$23.16. \int_1^3 \frac{1-\sqrt{x}}{\sqrt{x}(x+1)} dx.$$

$$23.17. \int \frac{\sqrt{8}}{\sqrt{3}} \frac{dx}{\sqrt{x^2+1}}.$$

$$23.18. \int_1^e \frac{1+\ln x}{x} dx.$$

$$23.19. \int_{\sqrt{2}}^2 \frac{dx}{\sqrt{x^2+1}}.$$

$$23.20. \int_1^e \frac{x^2 + \ln x^2}{x} dx.$$

$$23.21. \int_0^1 \frac{x dx}{\sqrt{x^4+x^2+1}}.$$

$$23.22. \int_0^1 \frac{x^3 dx}{(x^2+1)^2}.$$

$$23.23. \int_0^{\frac{\pi}{4}} \operatorname{tg} x \ln \cos x dx.$$

$$23.24. \int_{-1}^0 \frac{\operatorname{tg}(x+1)}{\cos^2(x+1)} dx.$$

$$23.25. \int_0^{\frac{1}{\sqrt{2}}} \frac{(\arccos x)^3 - 1}{\sqrt{1-x^2}} dx.$$

$$23.26. \int \frac{1-\cos x}{(x-\sin x)^2} dx.$$

$$23.27. \int_0^{\frac{\pi}{4}} \frac{\sin x - \cos x}{(\cos x + \sin x)^5} dx.$$

$$23.28. \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \frac{x \cos x + \sin x}{(x \sin x)^2} dx.$$

$$23.29. \int_0^1 \frac{x^3+x}{x^4+1} dx.$$

$$23.30. \int_{\sqrt{2}}^{\sqrt{3}} \frac{x dx}{\sqrt{x^4-x^2-1}}.$$

$$23.31. \int_2^9 \frac{x dx}{\sqrt{x-1}}.$$

Задача 24. Найти производную функции $F(x)$.

$$24.1. F(x) = \int \frac{\sqrt{x}}{\ln x} \sin(t^2) dt.$$

$$24.2. F(x) = \int \frac{\ln x}{\sqrt{x}} \cos(t^2) dt.$$

$$24.3. F(x) = \int \frac{\sin x}{\cos x} e^{t^2} dt.$$

$$24.4. F(x) = \int \frac{x}{\ln x} \frac{e^t}{t} dt.$$

$$24.5. F(x) = \int \frac{e^x}{x} \frac{\sin t}{t} dt.$$

$$24.6. F(x) = \int \frac{\ln x}{e^x} \frac{\cos t}{t} dt.$$

$$24.7. F(x) = \int \frac{x}{e^x} \frac{1}{\ln t} dt.$$

$$24.8. F(x) = \int \frac{\ln(x)}{e^x} \frac{\operatorname{sh} t}{t} dt.$$

$$24.9. F(x) = \int \frac{\cos x}{e^x} \frac{\operatorname{ch} t}{t} dt.$$

$$24.10. F(x) = \int_{x^2}^x \sin(t^2) dt.$$

$$24.11. F(x) = \int_{x+1}^{x^2} \cos(t^2) dt.$$

$$24.12. F(x) = \int \frac{\sqrt{x^3}}{\sqrt{x}} e^{t^2} dt.$$

$$24.13. F(x) = \int \frac{\sqrt{x}}{x^2} \frac{e^t}{t} dt.$$

$$24.14. F(x) = \int \frac{x}{\operatorname{arcsin} x} \frac{\sin t}{t} dt.$$

$$24.15. F(x) = \int \frac{x}{e^x} \frac{\cos t}{t} dt.$$

$$24.16. F(x) = \int \frac{\sin x}{\cos x} \frac{1}{\ln t} dt.$$

$$24.17. F(x) = \int \frac{x^3}{x^2} \frac{\operatorname{sh} t}{t} dt.$$

$$24.18. F(x) = \int \frac{x}{\ln x} \frac{\operatorname{ch} t}{t} dt.$$

$$24.19. F(x) = \int \frac{\sin x}{\sqrt{x}} \sin(t^2) dt.$$

$$24.20. F(x) = \int \frac{e^x}{e^x} \cos(t^2) dt.$$

$$24.21. F(x) = \int \frac{x}{\sqrt{\ln x}} e^{t^2} dt.$$

$$24.22. F(x) = \int \frac{\cos x}{\sin x} \frac{e^t}{t} dt.$$

$$24.23. F(x) = \int \frac{x^2}{\sqrt{x}} \frac{\sin t}{t} dt.$$

$$24.24. F(x) = \int \frac{x^3}{x^2} \frac{\cos t}{t} dt.$$

$$24.25. F(x) = \int \frac{x^3}{x^2} \frac{1}{\ln t} dt.$$

$$24.26. F(x) = \int \frac{x}{\sqrt{x}} \frac{\operatorname{sh} t}{t} dt.$$

$$24.27. F(x) = \int \frac{x^2}{x^3} \frac{\operatorname{ch} t}{t} dt.$$

$$24.28. F(x) = \int \frac{x}{\cos x} \sin(t^2) dt.$$

$$24.29. F(x) = \int \frac{\cos x}{\sqrt{x}} \cos(t^2) dt.$$

$$24.30. F(x) = \int \frac{x}{e^x} e^{t^2} dt.$$

$$24.31. F(x) = \int \frac{\operatorname{sh} x}{\operatorname{ch} x} \frac{e^t}{t} dt.$$

$$24.32. F(x) = \int \frac{x}{\ln x} \frac{\sin t}{t} dt.$$

Задача 25. Найти площадь фигуры, ограниченной данными линиями.

$$25.1. y = \frac{3}{x}, y = 4e^x, y^2 = 3, y = 4.$$

$$25.2. x = \sqrt{36-y^2}, x = 6 - \sqrt{36-y^2}.$$

$$25.3. x^2 + y^2 = 72, 6y = -x^2 (y \leq 0).$$

$$25.4. x = 8 - y^2, x = -2y.$$

$$25.5. y = \frac{3}{x}, y = 8e^x, y = 3, y = 8.$$

$$25.6. y = \frac{\sqrt{x}}{2}, y = \frac{1}{2x}, x = 16.$$

$$25.7. x = 5 - y^2, x = -4y.$$

$$25.8. x^2 + y^2 = 12, -\sqrt{6}y = x^2 (y \leq 0).$$

$$25.9. y = \sqrt{12-x^2}, y = 2\sqrt{3} - \sqrt{12-x^2}, x = 0 (x \geq 0).$$

$$25.10. y = \frac{3}{2}\sqrt{x}, y = \frac{3}{2x}, x = 9.$$

$$25.11. y = \sqrt{24-x^2}, 2\sqrt{3}y = x^2, x = 0 (x \geq 0).$$

$$25.12. y = \sin x, y = \cos x, x = 0 (x \geq 0).$$

$$25.13. y = 20 - x^2, y = -8x.$$

$$25.14. y = \sqrt{18-x^2}, y = 3\sqrt{2} - \sqrt{18-x^2}.$$

$$25.15. y = 32 - x^2, y = -4x.$$

$$25.16. y = \frac{2}{x}, y = 5e^x, y = 2, y = 5.$$

$$25.17. x^2 + y^2 = 36, 3\sqrt{2}y = x^2 (y \geq 0).$$

$$25.18. y = 3\sqrt{x}, y = \frac{3}{x}, x = 4.$$

$$25.19. y = 6 - \sqrt{36-x^2}, y = \sqrt{36-x^2}, x = 0 (x \geq 0).$$

$$25.20. x^2 + y^2 = 12, x\sqrt{6} = y^2 (x \geq 0).$$

$$25.21. y = \sqrt{x}, y = \frac{1}{x}, x = 16.$$

$$25.22. y = \frac{2}{x}, y = 7e^x, y = 2, y = 7.$$

$$25.23. x = 27 - y^2, x = -6y.$$

$$25.24. x = \sqrt{72-y^2}, 6x = y^2, y = 0 (y \geq 0).$$

$$25.25. y = \sqrt{6-x^2}, y = \sqrt{6} - \sqrt{6-x^2}.$$

$$25.26. y = \frac{3}{2}\sqrt{x}, y = \frac{3}{2x}, x = 4.$$

$$25.27. y = \sin x, y = \cos x, x = 0, (x \leq 0).$$

$$25.28. y = \frac{1}{x}, y = 6e^x, y = 1, y = 6.$$

$$25.29. y = 3\sqrt{x}, y = \frac{3}{x}, x = 9.$$

$$25.30. y = 11 - x^2, y = -10x.$$

$$25.31. y = \frac{25}{4-x^2}, y = x - \frac{5}{2}.$$

Задача 26. Найти площадь фигуры, ограниченной данными линиями.

$$26.1. \begin{cases} y^2 - 2y + x^2 = 0, \\ y^2 - 4y + x^2 = 0, \\ y = \frac{x}{\sqrt{3}}, y = \sqrt{3}x. \end{cases}$$

$$26.2. \begin{cases} x^2 - 4x + y^2 = 0, \\ x^2 - 8x + y^2 = 0, \\ y = 0, y = \frac{x}{\sqrt{3}}. \end{cases}$$

$$26.3. \begin{cases} y^2 - 6y + x^2 = 0, \\ y^2 - 8y + x^2 = 0, \\ y = \frac{x}{\sqrt{3}}, y = \sqrt{3}x. \end{cases}$$

$$26.4. \begin{cases} x^2 - 2x + y^2 = 0, \\ x^2 - 4x + y^2 = 0, \\ y = 0, y = x. \end{cases}$$

$$26.5. \begin{cases} y^2 - 8y + x^2 = 0, \\ y^2 - 10y + x^2 = 0, \\ y = \frac{x}{\sqrt{3}}, y = \sqrt{3}x. \end{cases}$$

$$26.6. \begin{cases} x^2 - 4x + y^2 = 0, \\ x^2 - 8x + y^2 = 0, \\ y = 0, y = x. \end{cases}$$

$$26.7. \begin{cases} y^2 - 4y + x^2 = 0, \\ y^2 - 6y + x^2 = 0, \\ y = x, x = 0. \end{cases}$$

$$26.8. \begin{cases} x^2 - 2x + y^2 = 0, \\ x^2 - 10x + y^2 = 0, \\ y = 0, y = \sqrt{3}x. \end{cases}$$

$$26.9. \begin{cases} y^2 - 6y + x^2 = 0, \\ y^2 - 10y + x^2 = 0, \\ y = x, x = 0. \end{cases}$$

$$26.10. \begin{cases} x^2 - 2x + y^2 = 0, \\ x^2 - 4x + y^2 = 0, \\ y = \frac{x}{\sqrt{3}}, y = \sqrt{3}x. \end{cases}$$

$$26.11. \begin{cases} y^2 - 2y + x^2 = 0, \\ y^2 - 4y + x^2 = 0, \\ y = \sqrt{3}x, x = 0. \end{cases}$$

$$26.12. \begin{cases} x^2 - 2x + y^2 = 0, \\ x^2 - 6x + y^2 = 0, \\ y = \frac{x}{\sqrt{3}}, y = \sqrt{3}x. \end{cases}$$

$$26.13. \begin{cases} y^2 - 4y + x^2 = 0, \\ y^2 - 6y + x^2 = 0, \\ y = \sqrt{3}x, x = 0. \end{cases}$$

$$26.14. \begin{cases} x^2 - 2x + y^2 = 0, \\ x^2 - 8x + y^2 = 0, \\ y = \frac{x}{\sqrt{3}}, y = \sqrt{3}x. \end{cases}$$

$$26.15. \begin{cases} y^2 - 2y + x^2 = 0, \\ y^2 - 6y + x^2 = 0, \\ y = \frac{x}{\sqrt{3}}, y = 0. \end{cases}$$

$$26.16. \begin{cases} x^2 - 2x + y^2 = 0, \\ x^2 - 4x + y^2 = 0, \\ y = 0, y = \frac{x}{\sqrt{3}}. \end{cases}$$

$$26.17. \begin{cases} y^2 - 2y + x^2 = 0, \\ y^2 - 10y + x^2 = 0, \\ y = \frac{x}{\sqrt{3}}, y = \sqrt{3}x. \end{cases}$$

$$26.18. \begin{cases} x^2 - 2x + y^2 = 0, \\ x^2 - 6x + y^2 = 0, \\ y = 0, y = \frac{x}{\sqrt{3}}. \end{cases}$$

$$26.19. \begin{cases} y^2 - 4y + x^2 = 0, \\ y^2 - 10y + x^2 = 0, \\ y = \frac{x}{\sqrt{3}}, y = \sqrt{3}x. \end{cases}$$

$$26.20. \begin{cases} x^2 - 2x + y^2 = 0, \\ x^2 - 6x + y^2 = 0, \\ y = 0, y = x. \end{cases}$$

$$26.21. \begin{cases} y^2 - 2y + x^2 = 0, \\ y^2 - 4y + x^2 = 0, \\ y = x, x = 0. \end{cases}$$

$$26.22. \begin{cases} x^2 - 2x + y^2 = 0, \\ x^2 - 4x + y^2 = 0, \\ y = 0, y = \sqrt{3}x. \end{cases}$$

$$26.23. \begin{cases} y^2 - 6y + x^2 = 0, \\ y^2 - 8y + x^2 = 0, \\ y = x, x = 0. \end{cases}$$

$$26.24. \begin{cases} x^2 - 4x + y^2 = 0, \\ x^2 - 8x + y^2 = 0, \\ y = 0, y = \sqrt{3}x. \end{cases}$$

$$26.25. \begin{cases} y^2 - 4y + x^2 = 0, \\ y^2 - 8y + x^2 = 0, \\ y = x, x = 0. \end{cases}$$

$$26.26. \begin{cases} x^2 - 4x + y^2 = 0, \\ x^2 - 8x + y^2 = 0, \\ y = \frac{x}{\sqrt{3}}, y = \sqrt{3}x. \end{cases}$$

$$26.27. \begin{cases} y^2 - 4y + x^2 = 0, \\ y^2 - 8y + x^2 = 0, \\ y = \sqrt{3}x, x = 0. \end{cases}$$

$$26.28. \begin{cases} x^2 - 4x + y^2 = 0, \\ x^2 - 6x + y^2 = 0, \\ y = \frac{x}{\sqrt{3}}, y = \sqrt{3}x. \end{cases}$$

$$26.29. \begin{cases} y^2 - 2y + x^2 = 0, \\ y^2 - 10y + x^2 = 0, \\ y = \frac{x}{\sqrt{3}}, x = 0. \end{cases}$$

$$26.30. \begin{cases} x^2 - 6x + y^2 = 0, \\ x^2 - 10x + y^2 = 0, \\ y = \frac{x}{\sqrt{3}}, y = \sqrt{3}x. \end{cases}$$

$$26.31. \begin{cases} y^2 - 4y + x^2 = 0, \\ y^2 - 8y + x^2 = 0, \\ y = \frac{x}{\sqrt{3}}, x = 0. \end{cases}$$

Задача 27. Вычислить площади фигур, ограниченных линиями, заданными уравнениями.

$$27.1. \begin{cases} x = 4\sqrt{2}\cos^3 t, \\ y = 2\sqrt{2}\sin^3 t, \\ x = 2 (x \geq 2). \end{cases}$$

$$27.2. \begin{cases} x = \sqrt{2}\cos t, \\ y = 2\sqrt{2}\sin t, \\ y = 2 (y \geq 2). \end{cases}$$

$$27.3. \begin{cases} x = 4(t - \sin t), \\ y = 4(1 - \cos t), \\ y = 4 (0 < x < 8\pi, y \geq 4). \end{cases}$$

$$27.4. \begin{cases} x = 16\cos^3 t, \\ y = 2\sin^3 t, \\ x = 2 (x \geq 2). \end{cases}$$

$$27.5. \begin{cases} x = 2\cos t, \\ y = 6\sin t, \\ y = 3 (y \geq 3). \end{cases}$$

$$27.6. \begin{cases} x = 2(t - \sin t), \\ y = 2(1 - \cos t), \\ y = 3 (0 < x < 4\pi, y \geq 3). \end{cases}$$

$$27.7. \begin{cases} x = 16\cos^3 t, \\ y = \sin^3 t, \\ x = 6\sqrt{3} (x \geq 6\sqrt{3}). \end{cases}$$

$$27.8. \begin{cases} x = 6\cos t, \\ y = 2\sin t, \\ y = \sqrt{3} (y \geq \sqrt{3}). \end{cases}$$

$$27.9. \begin{cases} x = 3(t - \sin t), \\ y = 3(1 - \cos t), \\ y = 3 (0 < x < 6\pi, y \geq 3). \end{cases}$$

$$27.10. \begin{cases} x = 8\sqrt{2}\cos^3 t, \\ y = \sqrt{2}\sin^3 t, \\ x = 4 (x \geq 4). \end{cases}$$

$$27.11. \begin{cases} x = 2\sqrt{2}\cos t, \\ y = 3\sqrt{2}\sin t, \\ y = 3 (y \geq 3). \end{cases}$$

$$27.12. \begin{cases} x = 6(t - \sin t), \\ y = 6(1 - \cos t), \\ y = 9 (0 < x < 12\pi, y \geq 9). \end{cases}$$

$$27.13. \begin{cases} x = 32\cos^3 t, \\ y = \sin^3 t, \\ x = 4 (x \geq 4). \end{cases}$$

$$27.14. \begin{cases} x = 3\cos t, \\ y = 8\sin t, \\ y = 4 (y \geq 4). \end{cases}$$

$$27.15. \begin{cases} x = 6(t - \sin t), \\ y = 6(1 - \cos t), \\ y = 6 (0 < x < 12\pi, y \geq 6). \end{cases}$$

$$27.16. \begin{cases} x = 8\cos^3 t, \\ y = 4\sin^3 t, \\ x = 3\sqrt{3} (x \geq 3\sqrt{3}). \end{cases}$$

$$27.17. \begin{cases} x = 6\cos^3 t, \\ y = 4\sin^3 t, \\ x = 2\sqrt{3} (x \geq 2\sqrt{3}). \end{cases}$$

$$27.18. \begin{cases} x = 10(t - \sin t), \\ y = 10(1 - \cos t), \\ y = 15 (0 < x < 20\pi, y \geq 15). \end{cases}$$

$$27.19. \begin{cases} x = 2\sqrt{2}\cos^3 t, \\ y = \sqrt{2}\sin^3 t, \\ x = 1 (x \geq 1). \end{cases}$$

$$27.20. \begin{cases} x = \sqrt{2}\cos t, \\ y = 4\sqrt{2}\sin t, \\ y = 4 (y \geq 4). \end{cases}$$

$$27.21. \begin{cases} x = t - \sin t, \\ y = 1 - \cos t, \\ y = 1 (0 < x < 2\pi, y \geq 1). \end{cases}$$

$$27.22. \begin{cases} x = 8\cos^3 t, \\ y = 8\sin^3 t, \\ x = 1 (x \geq 1). \end{cases}$$

$$27.23. \begin{cases} x = 9\cos t, \\ y = 4\sin t, \\ y = 2 (y \geq 2). \end{cases}$$

$$27.24. \begin{cases} x = 8(t - \sin t), \\ y = 8(1 - \cos t), \\ y = 12 (0 < x < 16\pi, y \geq 12). \end{cases}$$

$$27.25. \begin{cases} x = 24\cos^3 t, \\ y = 2\sin^3 t, \\ x = 9\sqrt{3} (x \geq 9\sqrt{3}). \end{cases}$$

$$27.26. \begin{cases} x = 3\cos t, \\ y = 8\sin t, \\ y = 4\sqrt{3} (y \geq 4\sqrt{3}). \end{cases}$$

$$27.27. \begin{cases} x = 2(t - \sin t), \\ y = 2(1 - \cos t), \\ y = 2 (0 < x < 4\pi, y \geq 2). \end{cases}$$

$$27.28. \begin{cases} x = 4\sqrt{2}\cos^3 t, \\ y = \sqrt{2}\sin^3 t, \\ x = 2 (x \geq 2). \end{cases}$$

$$27.29. \begin{cases} x = 2\sqrt{2}\cos t, \\ y = 5\sqrt{2}\sin t, \\ y = 5 (y \geq 5). \end{cases}$$

$$27.30. \begin{cases} x = 4(t - \sin t), \\ y = 4(1 - \cos t), \\ y = 6 (0 < x < 8\pi, y \geq 6). \end{cases}$$

$$27.31. \begin{cases} x = 32\cos^3 t, \\ y = 3\sin^3 t, \\ x = 12\sqrt{3} (x \geq 12\sqrt{3}). \end{cases}$$

Задача 28. Вычислить площади фигур, ограниченных линиями, заданными в полярных координатах.

28.1. $r = 4 \cos 3\varphi, r = 2 (r \geq 2)$.

28.2. $r = \cos 2\varphi$.

28.3. $\begin{cases} r = \sqrt{3} \cos \varphi, r = \sin \varphi, \\ (0 \leq \varphi \leq \frac{\pi}{2}). \end{cases}$

28.4. $r = 4 \sin 3\varphi, r = 2 (r \geq 2)$.

28.5. $\begin{cases} r = 2 \cos \varphi, r = 2\sqrt{3} \sin \varphi, \\ (0 \leq \varphi \leq \frac{\pi}{2}). \end{cases}$

28.6. $r = \sin 3\varphi$.

28.7. $r = 6 \sin 3\varphi, r = 3 (r \geq 3)$.

28.8. $r = \cos 3\varphi$.

28.9. $\begin{cases} r = \cos \varphi, \\ r = \sqrt{2} \sin (\varphi - \frac{\pi}{4}), \\ (-\frac{\pi}{4} \leq \varphi \leq \frac{\pi}{2}). \end{cases}$

28.10. $\begin{cases} r = \sin \varphi, \\ r = \sqrt{2} \cos (\varphi - \frac{\pi}{4}), \\ (0 \leq \varphi \leq \frac{3\pi}{4}). \end{cases}$

28.11. $r = 6 \cos 3\varphi, r = 3 (r \geq 3)$.

28.12. $r = \frac{1}{2} + \sin \varphi$.

28.13. $\begin{cases} r = \cos \varphi, r = \sin \varphi, \\ (0 \leq \varphi \leq \frac{\pi}{2}). \end{cases}$

28.14. $\begin{cases} r = \sqrt{2} \cos (\varphi - \frac{\pi}{4}), \\ r = \sqrt{2} \sin (\varphi - \frac{\pi}{4}), \\ (\frac{\pi}{4} \leq \varphi \leq \frac{3\pi}{4}). \end{cases}$

28.15. $r = \cos \varphi, r = 2 \cos \varphi$.

28.16. $r = \sin \varphi, r = 2 \sin \varphi$.

28.17. $r = 1 + \sqrt{2} \cos \varphi$.

28.18. $r = \frac{1}{2} + \cos \varphi$.

28.19. $r = 1 + \sqrt{2} \sin \varphi$.

28.20. $r = (\frac{5}{2}) \sin \varphi, r = (\frac{3}{2}) \sin \varphi$.

28.21. $r = (\frac{3}{2}) \cos \varphi, r = (\frac{5}{2}) \cos \varphi$.

28.22. $r = 4 \cos 4\varphi$.

28.23. $r = \sin 6\varphi$.

28.24. $r = 2 \cos \varphi, r = 3 \cos \varphi$.

28.25. $r = \cos \varphi + \sin \varphi$.

28.26. $r = 2 \sin 4\varphi$.

28.27. $r = 2 \cos 6\varphi$.

28.28. $r = \cos \varphi - \sin \varphi$.

28.29. $r = 3 \sin \varphi, r = 5 \sin \varphi$.

28.30. $r = 2 \sin \varphi, r = 4 \sin \varphi$.

28.31. $r = 6 \sin \varphi, r = 4 \sin \varphi$.

Задача 29. Вычислить длины дуг кривых, заданных уравнениями в прямоугольной системе координат.

29.1. $y = \ln x, \sqrt{3} \leq x \leq \sqrt{15}$.

29.2. $y = \frac{x^2}{4} - \frac{\ln x}{2}, 1 \leq x \leq 2$.

29.3. $y = \sqrt{1-x^2} + \arcsin x, 0 \leq x \leq \frac{7}{9}$.

29.4. $y = \ln \frac{5}{2x}, \sqrt{3} \leq x \leq \sqrt{8}$.

29.5. $y = -\ln \cos x, 0 \leq x \leq \frac{\pi}{6}$.

29.6. $y = e^x + 6, \ln \sqrt{8} \leq x \leq \ln \sqrt{15}$.

29.7. $y = 2 + \arcsin \sqrt{x} + \sqrt{x-x^2}, \frac{1}{4} \leq x \leq 1$.

29.8. $y = \ln(x^2 - 1), 2 \leq x \leq 3$.

29.9. $y = \sqrt{1-x^2} + \arccos x, 0 \leq x \leq \frac{8}{9}$.

29.10. $y = \ln(1-x^2), 0 \leq x \leq \frac{1}{4}$.

29.11. $y = 2 + \operatorname{ch} x, 0 \leq x \leq 1$.

29.12. $y = 1 - \ln \cos x, 0 \leq x \leq \frac{\pi}{6}$.

29.13. $y = e^x + 13, \ln \sqrt{15} \leq x \leq \ln \sqrt{24}$.

29.14. $y = -\arccos \sqrt{x} + \sqrt{x-x^2}, 0 \leq x \leq \frac{1}{4}$.

29.15. $y = 2 - e^x, \ln \sqrt{3} \leq x \leq \ln \sqrt{8}$.

29.16. $y = \arcsin x - \sqrt{1-x^2}, 0 \leq x \leq \frac{15}{16}$.

29.17. $y = 1 - \ln \sin x, \frac{\pi}{3} \leq x \leq \frac{\pi}{2}$.

29.18. $y = 1 - \ln(x^2 - 1), 3 \leq x \leq 4$.

29.19. $y = \sqrt{x-x^2} - \arccos \sqrt{x} + 5, \frac{1}{9} \leq x \leq 1$.

29.20. $y = -\arccos x + \sqrt{1-x^2} + 1, 0 \leq x \leq \frac{9}{16}$.

29.21. $y = \ln \sin x, \frac{\pi}{3} \leq x \leq \frac{\pi}{2}$.

29.22. $y = \ln 7 - \ln x, \sqrt{3} \leq x \leq \sqrt{8}$.

29.23. $y = \operatorname{ch} x + 3, 0 \leq x \leq 1$.

29.24. $y = 1 + \arcsin x - \sqrt{1-x^2}, 0 \leq x \leq \frac{3}{4}$.

29.25. $y = \ln \cos x + 2, 0 \leq x \leq \frac{\pi}{6}$.

29.26. $y = e^x + 26, \ln \sqrt{8} \leq x \leq \ln \sqrt{24}$.

29.27. $y = \frac{e^x + e^{-x}}{2} + 3, 0 \leq x \leq 2$.

29.28. $y = \arccos \sqrt{x} - \sqrt{x-x^2} + 4, 0 \leq x \leq \frac{1}{2}$.

29.29. $y = \frac{e^x + e^{-x} + 3}{4}, 0 \leq x \leq 2$.

29.30. $y = e^x + e, \ln \sqrt{3} \leq x \leq \ln \sqrt{15}$.

29.31. $y = \frac{1-e^x-e^{-x}}{2}, 0 \leq x \leq 3$.

Задача 30. Вычислить длины дуг кривых, заданных параметрическими уравнениями.

30.1. $\begin{cases} x = 5(t - \sin t), \\ y = 5(1 - \cos t), \\ 0 \leq t \leq \pi. \end{cases}$

30.2. $\begin{cases} x = 3(2 \cos t - \cos 2t), \\ y = 3(2 \sin t - \sin 2t), \\ 0 \leq t \leq 2\pi. \end{cases}$

30.3. $\begin{cases} x = 4(\cos t + t \sin t), \\ y = 4(\sin t - t \cos t), \\ 0 \leq t \leq 2\pi. \end{cases}$

30.4. $\begin{cases} x = (t^2 - 2) \sin t + 2t \cos t, \\ y = (2 - t^2) \cos t + 2t \sin t, \\ 0 \leq t \leq \pi. \end{cases}$

30.5. $\begin{cases} x = 10 \cos^3 t, \\ y = 10 \sin^3 t, \\ 0 \leq t \leq \frac{\pi}{2}. \end{cases}$

30.6. $\begin{cases} x = e^t (\cos t + \sin t), \\ y = e^t (\cos t - \sin t), \\ 0 \leq t \leq \pi. \end{cases}$

30.7. $\begin{cases} x = 3(t - \sin t), \\ y = 3(1 - \cos t), \\ \pi \leq t \leq 2\pi. \end{cases}$

30.8. $\begin{cases} x = \frac{1}{2} \cos t - \frac{1}{4} \cos 2t, \\ y = \frac{1}{2} \sin t - \frac{1}{4} \sin 2t, \\ \frac{\pi}{2} \leq t \leq \frac{2\pi}{3}. \end{cases}$

30.9. $\begin{cases} x = 3(\cos t + t \sin t), \\ y = 3(\sin t - t \cos t), \\ 0 \leq t \leq \frac{\pi}{3}. \end{cases}$

30.10. $\begin{cases} x = (t^2 - 2) \sin t + 2t \cos t, \\ y = (2 - t^2) \cos t + 2t \sin t, \\ 0 \leq t \leq \frac{\pi}{3}. \end{cases}$

30.11. $\begin{cases} x = 6 \cos^3 t, \\ y = 6 \sin^3 t, \\ 0 \leq t \leq \frac{\pi}{3}. \end{cases}$

30.12. $\begin{cases} x = e^t (\cos t + \sin t), \\ y = e^t (\cos t - \sin t), \\ \frac{\pi}{2} \leq t \leq \pi. \end{cases}$

30.13. $\begin{cases} x = 2.5(t - \sin t), \\ y = 2.5(1 - \cos t), \\ \frac{\pi}{2} \leq t \leq \pi. \end{cases}$

30.14. $\begin{cases} x = 3.5(2 \cos t - \cos 2t), \\ y = 3.5(2 \sin t - \sin 2t), \\ 0 \leq t \leq \frac{\pi}{2}. \end{cases}$

30.15. $\begin{cases} x = 6(\cos t + t \sin t), \\ y = 6(\sin t - t \cos t), \\ 0 \leq t \leq \pi. \end{cases}$

30.16. $\begin{cases} x = (t^2 - 2) \sin t + 2t \cos t, \\ y = (2 - t^2) \cos t + 2t \sin t, \\ 0 \leq t \leq \frac{\pi}{2}. \end{cases}$

30.17. $\begin{cases} x = 8 \cos^3 t, \\ y = 8 \sin^3 t, \\ 0 \leq t \leq \frac{\pi}{6}. \end{cases}$

30.18. $\begin{cases} x = e^t (\cos t + \sin t), \\ y = e^t (\cos t - \sin t), \\ 0 \leq t \leq 2\pi. \end{cases}$

30.19. $\begin{cases} x = 4(t - \sin t), \\ y = 4(1 - \cos t), \\ \frac{\pi}{2} \leq t \leq \frac{2\pi}{3}. \end{cases}$

30.20. $\begin{cases} x = 2(2 \cos t - \cos 2t), \\ y = 2(2 \sin t - \sin 2t), \\ 0 \leq t \leq \frac{\pi}{3}. \end{cases}$

30.21. $\begin{cases} x = 8(\cos t + t \sin t), \\ y = 8(\sin t - t \cos t), \\ 0 \leq t \leq \frac{\pi}{4}. \end{cases}$

30.22. $\begin{cases} x = (t^2 - 2) \sin t + 2t \cos t, \\ y = (2 - t^2) \cos t + 2t \sin t, \\ 0 \leq t \leq 2\pi. \end{cases}$

30.23. $\begin{cases} x = 4 \cos^3 t, \\ y = 4 \sin^3 t, \\ \frac{\pi}{6} \leq t \leq \frac{\pi}{4}. \end{cases}$

30.24. $\begin{cases} x = e^t (\cos t + \sin t), \\ y = e^t (\cos t - \sin t), \\ 0 \leq t \leq \frac{3\pi}{2}. \end{cases}$

30.25. $\begin{cases} x = 2(t - \sin t), \\ y = 2(1 - \cos t), \\ 0 \leq t \leq \frac{\pi}{2}. \end{cases}$

30.26. $\begin{cases} x = 4(2 \cos t - \cos 2t), \\ y = 4(2 \sin t - \sin 2t), \\ 0 \leq t \leq \pi. \end{cases}$

$$30.27. \begin{cases} x = 2(\cos t + t \sin t), \\ y = 2(\sin t - t \cos t), \\ 0 \leq t \leq \frac{\pi}{2}. \end{cases}$$

$$30.29. \begin{cases} x = 2 \cos^3 t, \\ y = 2 \sin^3 t, \\ 0 \leq t \leq \frac{\pi}{4}. \end{cases}$$

$$30.31. \begin{cases} x = (t^2 - 2) \sin t + 2t \cos t, \\ y = (2 - t^2) \cos t + 2t \sin t, \\ 0 \leq t \leq \pi. \end{cases}$$

$$30.28. \begin{cases} x = (t^2 - 2) \sin t + 2t \cos t, \\ y = (2 - t^2) \cos t + 2t \sin t, \\ 0 \leq t \leq 3\pi. \end{cases}$$

$$30.30. \begin{cases} x = e^t (\cos t + \sin t), \\ y = e^t (\cos t - \sin t), \\ \frac{\pi}{6} \leq t \leq \frac{\pi}{4}. \end{cases}$$

Задача 31. Вычислить объемы тел, ограниченных поверхностями.

$$31.1. \frac{x^2}{9} + y^2 = 1, z = y, z = 0 (y \geq 0).$$

$$31.2. z = x^2 + 4y^2, z = 2.$$

$$31.3. \frac{x^2}{9} + \frac{y^2}{4} - z^2 = 1, z = 0, z = 3.$$

$$31.4. \frac{x^2}{9} + \frac{y^2}{4} - \frac{z^2}{36} = -1, z = 12.$$

$$31.5. \frac{x^2}{16} + \frac{y^2}{9} + \frac{z^2}{4} = 1, z = 1, z = 0.$$

$$31.6. x^2 + y^2 = 9, z = y, z = 0 (y \geq 0).$$

$$31.7. z = x^2 + 9y^2, z = 3.$$

$$31.8. \frac{x^2}{4} + y^2 - z^2 = 1, z = 0, z = 3.$$

$$31.9. \frac{x^2}{9} + \frac{y^2}{16} - \frac{z^2}{64} = -1, z = 16.$$

$$31.10. \frac{x^2}{16} + \frac{y^2}{9} + \frac{z^2}{16} = 1, z = 2, z = 0.$$

$$31.11. \frac{x^2}{3} + \frac{y^2}{4} = 1, z = y\sqrt{3}, z = 0 (y \geq 0).$$

$$31.12. z = 2x^2 + 8y^2, z = 4.$$

$$31.13. \frac{x^2}{81} + \frac{y^2}{25} - z^2 = 1, z = 0, z = 2.$$

$$31.14. \frac{x^2}{4} + \frac{y^2}{9} - \frac{z^2}{36} = -1, z = 12.$$

$$31.15. \frac{x^2}{16} + \frac{y^2}{9} + \frac{z^2}{36} = 1, z = 3, z = 0.$$

$$31.16. \frac{x^2}{3} + \frac{y^2}{16} = 1, z = y\sqrt{3}, z = 0 (y \geq 0).$$

$$31.17. z = x^2 + 5y^2, z = 5.$$

$$31.18. \frac{x^2}{9} + \frac{y^2}{4} - z^2 = 1, z = 0, z = 4.$$

$$31.19. \frac{x^2}{9} + \frac{y^2}{25} - \frac{z^2}{100} = -1, z = 20.$$

$$31.20. \frac{x^2}{16} + \frac{y^2}{9} + \frac{z^2}{64} = 1, z = 4, z = 0.$$

$$31.21. \frac{x^2}{27} + \frac{y^2}{25} = 1, z = \frac{y}{\sqrt{3}}, z = 0 (y \geq 0).$$

$$31.22. z = 4x^2 + 9y^2, z = 6.$$

$$31.23. x^2 + \frac{y^2}{4} - z^2 = 1, z = 0, z = 3.$$

$$31.24. \frac{x^2}{25} + \frac{y^2}{9} - \frac{z^2}{100} = -1, z = 20.$$

$$31.25. \frac{x^2}{16} + \frac{y^2}{9} + \frac{z^2}{100} = 1, z = 5, z = 0.$$

$$31.26. \frac{x^2}{27} + y^2 = 1, z = \frac{y}{\sqrt{3}}, z = 0 (y \geq 0).$$

$$31.27. z = 2x^2 + 18y^2, z = 6.$$

$$31.28. \frac{x^2}{25} + \frac{y^2}{9} - z^2 = 1, z = 0, z = 2.$$

$$31.29. \frac{x^2}{16} + \frac{y^2}{9} - \frac{z^2}{64} = -1, z = 16.$$

$$31.30. \frac{x^2}{16} + \frac{y^2}{9} + \frac{z^2}{144} = 1, z = 6, z = 0.$$

$$31.31. \frac{x^2}{16} + \frac{y^2}{9} + \frac{z^2}{196} = 1, z = 7, z = 0.$$

Задача 32. Вычислить объемы тел, образованных вращением фигур, ограниченных графиками функций. В вариантах 1-16 ось вращения Ox , в вариантах 17-31 ось вращения Oy .

$$32.1. y = -x^2 + 5x - 6, y = 0.$$

$$32.2. 2x - x^2 - y = 0, 2x^2 - 4x + y = 0.$$

$$32.3. y = 3 \sin x, y = \sin x, 0 \leq x \leq \pi.$$

$$32.4. y = 5 \cos x, y = \cos x, x = 0, x \geq 0.$$

$$32.5. y = \sin^2 x, x = \frac{\pi}{2}, y = 0.$$

$$32.6. x = \sqrt[3]{y-2}, x = 1, y = 1.$$

$$32.7. y = xe^x, y = 0, x = 1.$$

$$32.8. y = 2x - x^2, y = -x + 2, x = 0.$$

$$32.9. y = 2x - x^2, y = -x + 2.$$

$$32.10. y = e^{1-x}, y = 0, x = 0, x = 1.$$

$$32.11. y = x^2, y^2 - x = 0.$$

$$32.12. x^2 + (y-2)^2 = 1.$$

$$32.13. y = 1 - x^2, x = 0, x = \sqrt{y-1}, x = 1.$$

$$32.14. y = x^2, y = 1, x = 2.$$

$$32.15. y = x^2, y = \sqrt{x}.$$

$$32.16. y = \sin\left(\frac{\pi x}{2}\right), y = x^2.$$

$$32.17. y = \arccos\left(\frac{x}{3}\right), y = \arccos x, y = 0.$$

$$32.18. y = \arcsin\left(\frac{x}{5}\right), y = \arcsin x, y = \frac{\pi}{2}.$$

$$32.19. y = x^2, x = 2, y = 0.$$

$$32.20. y = x^2 + 1, y = x, x = 0, y = 0.$$

$$32.21. y = \sqrt{x-1}, y = 0, y = 1, x = 0, 5.$$

$$32.22. y = \ln x, x = 2, y = 0.$$

$$32.23. y = (x-1)^2, y = 1.$$

$$32.24. y^2 = x - 2, y = 0, y = x^3, y = 1.$$

$$32.25. y = x^3, y = x^2.$$

$$32.26. y = \arccos\left(\frac{x}{5}\right), y = \arccos\left(\frac{x}{3}\right), y = 0.$$

$$32.27. y = \arcsin x, y = \arccos x, y = 0.$$

$$32.28. y = x^2 - 2x + 1, x = 2, y = 0.$$

$$32.29. y = x^3, y = x.$$

$$32.30. y = \arccos x, y = \arcsin x, x = 0.$$

$$32.31. y = (x-1)^2, x = 0, x = 2, y = 0.$$

Задача 33. Вычислить длины дуг кривых, заданных уравнениями в полярных координатах.

$$33.1. \rho = 3e^{\frac{3\varphi}{4}}, -\frac{\pi}{2} \leq \varphi \leq \frac{\pi}{2}.$$

$$33.2. \rho = \sin^5\left(\frac{\varphi}{5}\right).$$

$$33.3. \rho = 5(1 - \cos \varphi), \frac{\pi}{2} \leq \varphi \leq \pi.$$

$$33.4. \rho = 3 \cos^3\left(\frac{\varphi}{3}\right).$$

$$33.5. \rho = 3(1 + \sin \varphi), -\frac{\pi}{6} \leq \varphi \leq 0.$$

$$33.6. \rho = \frac{1}{\cos^4(\varphi/4)}.$$

$$33.7. \rho = 4(1 - \sin \varphi), 0 \leq \varphi \leq \frac{\pi}{6}.$$

$$33.8. \rho = 2(1 + \cos \varphi), 0 \leq \varphi \leq \frac{\pi}{2}.$$

$$33.9. \rho = 3\varphi, 0 \leq \varphi \leq \frac{4}{3}.$$

$$33.10. \rho = 6 \cos \varphi, 0 \leq \varphi \leq \frac{\pi}{3}.$$

$$33.11. \rho = \frac{2}{\sin^4(\varphi/4)}.$$

$$33.12. \rho = 2 \sin \varphi, 0 \leq \varphi \leq \frac{\pi}{6}.$$

$$33.13. \rho = 2 \operatorname{th} \frac{\varphi}{2}, 0 \leq \varphi \leq 2.$$

$$33.14. \rho = \frac{5}{\sin^2(\varphi/2)}, \frac{\pi}{2} \leq \varphi \leq \frac{3\pi}{2}.$$

$$33.15. \rho = 7(1 - \sin \varphi), -\frac{\pi}{6} \leq \varphi \leq \frac{\pi}{6}.$$

$$33.16. \rho = 3 \cos^4\left(\frac{\varphi}{4}\right).$$

$$33.17. \rho = \frac{3}{\sin^3(\varphi/3)}.$$

$$33.18. \rho = \varphi^4, 0 \leq \varphi \leq 3.$$

$$33.19. \rho = \frac{4}{\cos^3(\varphi/3)}.$$

$$33.20. \rho = 5 \cos^2\left(\frac{\varphi}{2}\right).$$

$$33.21. \rho = 4 \sin^3\left(\frac{\varphi}{3}\right).$$

$$33.22. \rho = 5e^{\frac{5\varphi}{12}}, -\frac{\pi}{2} \leq \varphi \leq \frac{\pi}{2}.$$

$$33.23. \rho = 4\varphi^2, 0 \leq \varphi \leq 4.$$

$$33.24. \rho = 5(1 - \cos \varphi).$$

$$33.25. \rho = \frac{6}{\cos^2(\varphi/2)}, -\frac{\pi}{2} \leq \varphi \leq \frac{\pi}{2}.$$

$$33.26. \rho = 6(1 + \sin \varphi), -\frac{\pi}{2} \leq \varphi \leq 0.$$

$$33.27. \rho = 2 \sin^4\left(\frac{\varphi}{4}\right).$$

$$33.28. \rho = \cos^5\left(\frac{\varphi}{5}\right).$$

$$33.29. \rho = 4 \sin^2\left(\frac{\varphi}{2}\right).$$

$$33.30. \rho = 5\varphi^3, 0 \leq \varphi \leq 4.$$

$$33.31. \rho = 8(1 + \cos \varphi), 0 \leq \varphi \leq \frac{2\pi}{3}.$$

$$33.32. \rho = 3 \operatorname{th} \frac{\varphi}{2}, 0 \leq \varphi \leq 4.$$