

Review 2.

Evaluate the following integrals.

1.

$$\int \frac{1}{2x^2 - 4x + 9} dx$$

2.

$$\int \frac{x - 5}{x^2 - 2x + 2} dx$$

3.

$$\int \frac{x^3}{x^2 + x + \frac{1}{2}} dx$$

4.

$$\int \frac{1}{x(x^2 + 5)} dx$$

5.

$$\int \frac{1}{(x + 2)^2(x + 3)^3} dx$$

6.

$$\int \frac{1}{(x + 1)^2(x^2 + 1)} dx$$

7.

$$\int \frac{1}{(x^2 + 2)^2} dx$$

8.

$$\int \frac{1}{x^4 - 2x^2 + 1} dx$$

9.

$$\int \frac{3 - 4x}{(1 - 2\sqrt{x})^2} dx$$

10.

$$\int \frac{(\sqrt{x} + 1)^2}{x^3} dx$$

11.

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

12.

$$\int \frac{1 - \sqrt[3]{2x}}{\sqrt{2x}} dx$$

13.

$$\int \frac{1}{(\sqrt[3]{x^2} + \sqrt[3]{x})^2} dx$$

14.

$$\int \frac{2x+1}{\sqrt{(4x^2-2x+1)^3}} dx$$

15.

$$\int \frac{x^2}{\sqrt{(x^2-1)^3}} dx$$

16.

$$\int \frac{x}{(1+x^2)\sqrt{1-x^4}} dx$$

Hint. If you arrive to the integral $\int \frac{1}{1+\sin \theta} d\theta$, multiply the integrand by $\frac{1-\sin \theta}{1-\sin \theta}$.

17.

$$\int \frac{x}{\sqrt{1-2x^2-x^4}} dx$$

18.

$$\int \frac{x+1}{\sqrt{(x^2+1)^3}} dx$$

19.

$$\int \sqrt{x^2-9} dx$$

20.

$$\int \sqrt{x-4x^2} dx$$

21.

$$\int x\sqrt{x^2+2x+2} dx$$

22.

$$\int \frac{1}{x^4\sqrt{x^2-1}} dx$$

23.

$$\int \cos^4 x dx$$

24.

$$\int \frac{1}{\cos x \sin^5 x} dx$$

25.

$$\int \frac{1+\sqrt{\cot x}}{\sin^2 x} dx$$

26.

$$\int \frac{\sin^3 x}{\sqrt[5]{\cos^3 x}} dx$$

27.

$$\int \frac{1}{\sin^3(5x)} dx$$

28.

$$\int \frac{\sin^2 x}{\cos^6 x} dx$$

29.

$$\int \frac{1}{\cos^2 x \sqrt{\tan^2 x + 4 \tan x + 1}} dx$$

30.

$$\int \frac{x}{\cos^2 3x} dx$$

31.

$$\int x \sin^2 x dx$$

32.

$$\int x^2 e^{x^3} dx$$

33.

$$\int x e^{2x} dx$$

34.

$$\int x \ln \sqrt{x-1} dx$$

35.

$$\int \frac{x \arctan x}{\sqrt{x^2+1}} dx$$

36.

$$\int \frac{1}{(\cos x + \sin x)^2} dx$$

Hint. Factor out $\cos x$.

37.

$$\int \frac{1}{(\tan x + 1) \sin^2 x} dx$$

38.

$$\int \frac{1}{e^{2x} - 2e^x} dx$$

39.

$$\int \frac{e^x}{e^{2x} - 6e^x + 13} dx$$

40.

$$\int \frac{e^{2x}}{(e^x + 1)^{\frac{1}{4}}} dx$$

41.

$$\int \frac{2^x}{1 - 4^x} dx$$

42.

$$\int (x^2 - 1)e^{2x} dx$$

43.

$$\int \sqrt{e^x + 1} dx$$

44.

$$\int \frac{\arctan x}{x^2} dx$$

45.

$$\int x^3 \arcsin \frac{1}{x} dx$$

46.

$$\int \cos(\ln x) dx$$

47.

$$\int (x^2 - 3x) \sin 5x dx$$

48.

$$\int x \arctan(2x + 3) dx$$

49.

$$\int \arcsin \sqrt{x} dx$$

50. Find the arc length of the parabola $y^2 = 4x$ from $x = 0$ to $x = 1$.51. Find the arc length of the curve $y = \ln x$ from $x = \sqrt{3}$ to $x = \sqrt{8}$.52. Find the arc length of the curve $y = \arcsin e^{-x}$ from $x = 0$ to $x = 1$.53. Find the arc length of the curve $x = \frac{1}{4}y^2 - \frac{1}{2} \ln y$ from $y = 1$ to $y = e$.54. Find the area of a surface formed by the rotation, about x -axis or an arc of the curve $9x = y^2 + 18$, from $x = 2$ to $x = 6$.55. Find the area of a surface formed by the rotation, about x -axis or an arc of the curve $y = \frac{x^3}{6} + \frac{1}{2x}$, from $x = \frac{1}{2}$ to $x = 1$.56. Find the area of a surface formed by the rotation, about y -axis or an arc of the curve $x = \sqrt{1 - y}$, from $x = 0$ to $x = 1$.