Exercise 1

Evaluate each indefinite integral.

1. $\int x^7 dx.$
2. $\int x^{3/2} dx.$
3. $\int 6x^5 dx.$
4. $\int 8x^3 - 4x^2 + 5 dx.$
5. $\int \sqrt{x^4} dx.$
6. $\int x \sqrt{x} dx.$
7. $\int \sqrt[3]{\sqrt{x}} dx.$

Exercise 2

A company’s marginal revenue function is $MR = 12 \sqrt[3]{x} + 3 \sqrt{x}$, where $x$ is the number of units sold. Find the revenue function.

Exercise 3

The value of an apartment in the center of Riga increases at the rate of $600 \sqrt{t}$ euros per year after $t$ years. Its value now is 200000 euros. What will be the price of this flat in 25 years?

Exercise 4

Evaluate each definite integral.

1. $\int_0^2 x^3 dx.$
2. $\int_{-1}^1 1 - x^2 dx.$
3. $\int_4^9 \frac{1}{\sqrt{x}} dx.$
4. $\int_1^2 6x^2 + 4x - 1 dx.$
Exercise 5

- Evaluate the indefinite integral \( \int x^2 dx \).
- Evaluate the definite integral \( \int_0^3 x^2 dx \) by including the constant \( C \).
- Explain why the constant does not matter when we evaluate a definite integral.

Exercise 6

1. Show that the area of a rectangle of length \( (b - a) \) and height \( h \) is \( h(b - a) \) using integral calculus.

2. Show that the area of a triangle of base \( a \) and height \( h \) is \( \frac{ha}{2} \) using integral calculus.

Exercise 7

A guitar dealer estimates that the newest model will sell at the rate of \( \frac{30}{t} \) guitars per month, where \( t \) is measured in months and \( t = 1 \) corresponds to the beginning of January. Find the number of guitars that will be sold from the beginning of January to the beginning of May.

Exercise 8

Find the area bounded by the two curves \( y_1 = \sqrt{x} \) and \( y_2 = x^2 \).