

TULETISTE TABEL

$c' = 0$	$x' = 1$	$\left(\frac{1}{x}\right)' = -\frac{1}{x^2}$
$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$	$(x^n)' = nx^{n-1}$	$(e^x)' = e^x$
$(a^x)' = a^x \ln a$	$(\ln x)' = \frac{1}{x}$	$(\log_a x)' = \frac{1}{x \ln a}$
$(\sin x)' = \cos x$	$(\cos x)' = -\sin x$	$(\tan x)' = \frac{1}{\cos^2 x}$
$(\arcsin x)' = \frac{1}{\sqrt{1-x^2}}$	$(\arccos x)' = \frac{-1}{\sqrt{1-x^2}}$	$(\arctan x)' = \frac{1}{1+x^2}$

INTEGRAALIDE TABEL

$\int 0 dx = C$	$\int dx = x + C$	$\int \frac{dx}{x^2} = -\frac{1}{x} + C$
$\int \frac{dx}{\sqrt{x}} = 2\sqrt{x} + C$	$\int x^n dx = \frac{x^{n+1}}{n+1} + C$ ($n \neq -1$)	$\int e^x dx = e^x + C$
$\int a^x dx = \frac{a^x}{\ln a} + C$	$\int \frac{1}{x} dx = \ln x + C$	$\int \frac{dx}{\sin^2 x} = -\cot x + C$
$\int \cos x dx = \sin x + C$	$\int \sin x dx = -\cos x + C$	$\int \frac{dx}{\cos^2 x} = \tan x + C$
$\int \frac{dx}{\sqrt{1-x^2}} = \arcsin x + C$	$\int \frac{dx}{\sqrt{1-x^2}} = -\arccos x + C$	$\int \frac{dx}{1+x^2} = \arctan x + C$

532. Integreeri.

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|------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|
| a) $\int 3x^2 dx$ | b) $\int x^4 dx$ | c) $\int x^7 dx$ | d) $\int x^{1997} dx$ |
| e) $\int dx$ | f) $\int x^{15} dx$ | g) $\int x^{-0.2} dx$ | h) $\int x^{-1997} dx$ |
| i) $\int \sqrt[3]{x} dx$ | j) $\int (-3) dx$ | k) $\int \sqrt[n]{x} dx$ | l) $\int \sqrt[1997]{x} dx$ |
| m) $\int \frac{1}{\sqrt[3]{x}} dx$ | n) $\int \frac{1}{\sqrt[3]{x^2}} dx$ | o) $\int \frac{1}{\sqrt[n]{x}} dx$ | p) $\int \frac{1}{\sqrt[1997]{x}} dx$ |
| q) $\int 3 \sin x dx$ | r) $\int -5 \cos x dx$ | s) $\int \frac{-7 dx}{\cos^2 x}$ | t) $\int \frac{5 dx}{\sin^2 x}$ |
| u) $\int \frac{2 dx}{1+x^2}$ | v) $\int \frac{dx}{\sqrt{1-x^2}}$ | w) $\int \frac{-5 dx}{\sqrt{1-x^2}}$ | õ) $\int \frac{2 dx}{x}$ |

Kui $\int f(x) dx = F(x) + C$, siis $\int f(ax+b) dx = \frac{1}{a} F(ax+b) + C$.

$$\int \frac{f'(x)}{f(x)} dx = \ln|f(x)| + C.$$

$$\int [f(x)]^n \cdot f'(x) dx = \frac{[f(x)]^{n+1}}{n+1} + C, \text{ kui } n \neq -1.$$

$$\int f(x) dx = \int f(\varphi(t)) \cdot \varphi'(t) dt, \text{ kui } x = \varphi(t).$$

$$\int f(x) g'(x) dx = f(x) g(x) - \int g(x) f'(x) dx.$$

541. Integreeri.

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|-----------------------------------|-----------------------------------|----------------------------------|
| a) $\int \sqrt{3x+1} dx$ | b) $\int e^{5-2x} dx$ | c) $\int (-1-x)^{1997} dx$ |
| d) $\int \sqrt[3]{3x+1} dx$ | e) $\int \sqrt[4]{5-2x} dx$ | f) $\int \frac{dx}{-x-1}$ |
| g) $\int 3^{3x+1} dx$ | h) $\int (5-2x)^7 dx$ | i) $\int (-x-1)^{-11} dx$ |
| j) $\int \cos(3x+1) dx$ | k) $\int \frac{dx}{5-2x}$ | l) $\int \frac{dx}{e^{x+1}}$ |
| m) $\int (3x+1)^5 dx$ | n) $\int \sin(5-2x) dx$ | o) $\int \frac{dx}{5 \cdot 5^x}$ |
| p) $\int \frac{dx}{\cos^2(3x+1)}$ | q) $\int \frac{dx}{\sin^2(5-2x)}$ | r) $\int \sqrt[1997]{-x-1} dx$ |

542. Integreeri.

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|--------------------------------|--|-------------------------------------|
| a) $\int \frac{2x}{x^2+4} dx$ | b) $\int \frac{4x^3}{x^4-4} dx$ | c) $\int \frac{2x+2}{x^2+2x-3} dx$ |
| d) $\int \frac{x}{4+x^2} dx$ | e) $\int \frac{x^3}{x^4-4} dx$ | f) $\int \frac{x+1}{x^2+2x-3} dx$ |
| g) $\int \frac{x}{4-x^2} dx$ | h) $\int \frac{2x^3}{(2-x)^2(2+x)^2} dx$ | i) $\int \frac{x+1}{(x-1)(x+3)} dx$ |
| j) $\int \cot x dx$ | k) $\int \frac{dx}{x \ln x}$ | l) $\int \frac{x-1}{(x-1)(x+3)} dx$ |
| m) $\int \frac{e^x}{e^x-e} dx$ | n) $\int \tan 2x dx$ | o) $\int \tan(ax+b) dx$ |

533. Integreeri

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|----------------------------|--------------------------|---------------------|------------------------------------|
| a) $\int \frac{dx}{2x}$ | b) $\int \frac{dx}{-3x}$ | c) $\int 3^x dx$ | d) $\int 3^x \ln 3 dx$ |
| e) $\int 4e^x dx$ | f) $\int \frac{dx}{-3}$ | g) $\int 3^3 dx$ | h) $\int x^3 \ln 3 dx$ |
| i) $\int e^2 \cdot e^x dx$ | j) $\int e^{x+2} dx$ | k) $\int x^{-1} dx$ | l) $\int (\sin^2 x + \cos^2 x) dx$ |

534. Lihtsusta avaldist ja integreeri.

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|---------------------------------|--------------------------------|----------------------------------|
| a) $\int (x-1)(x+2) dx$ | b) $\int (2x-3)(3x+1) dx$ | c) $\int (x+2)^2 dx$ |
| d) $\int x(x^2-1) dx$ | e) $\int 3(2x-1)^2 dx$ | f) $\int (-x-2)^2 dx$ |
| g) $\int \frac{x^2-1}{x+1} dx$ | h) $\int \frac{x^3-1}{x-1} dx$ | i) $\int \frac{x^2-4}{x-2} dx$ |
| j) $\int \frac{5x^2-5}{x+1} dx$ | k) $\int \frac{x^3-1}{1-x} dx$ | l) $\int \frac{16-4x^2}{x+2} dx$ |

535. Teisenda avaldist ja integreeri.

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|----------------------------|------------------------------------|---|---|
| a) $\int \frac{x-5}{5} dx$ | b) $\int \frac{x-5}{x} dx$ | c) $\int \frac{x^2-5}{x^2} dx$ | d) $\int \frac{x^2-5}{x} dx$ |
| e) $\int x \sqrt{x} dx$ | f) $\int x^3 \cdot \sqrt[3]{x} dx$ | g) $\int \sqrt{x} \cdot \sqrt[3]{x} dx$ | h) $\int \sqrt{x^3} \cdot \sqrt[3]{x} dx$ |

536. Leia määramata integraal.

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|-----------------------------------|----------------------------------|--|
| a) $\int (t + \sin t) dt$ | b) $\int (\cos u - 4 \sin u) du$ | c) $\int \tan x \cdot \cos x dx$ |
| d) $\int \cos 2\pi dx$ | e) $\int \sin 2\pi dx$ | f) $\int \sin(\pi - x) dx$ |
| g) $\int \sin(2\pi - t) dt$ | h) $\int \sin(\pi + u) du$ | i) $\int \tan(-\pi) dv$ |
| j) $\int \frac{dx}{1 - \sin^2 x}$ | k) $\int (1 + \tan^2 x) dx$ | l) $\int \frac{1 - \cos^2 x}{\sin x} dx$ |

537. Teisenda avaldist ja integreeri.

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|-----------------------------------|--|-------------------------------------|
| a) $\int \frac{x^2-2x+1}{x} dx$ | b) $\int \frac{x^2-2x+1}{2} dx$ | c) $\int \frac{x^2-3x+2}{x-2} dx$ |
| d) $\int \frac{u^2-3u+2}{2-u} du$ | e) $\int \frac{2x^2-4x+2}{x-1} dx$ | f) $\int \frac{t^3-8}{2-t} dt$ |
| g) $\int (x + \sqrt{x})^2 dx$ | h) $\int \left(x + \frac{1}{\sqrt{x}}\right)^2 dx$ | i) $\int (x^2 + x^2)(x^2 - x^2) dx$ |

543. Integreeri.

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|--------------------------------------|--|---|
| a) $\int \sin^2 x \cos x dx$ | b) $\int \cos^3 x \sin x dx$ | c) $\int \cos x \sin x dx$ |
| d) $\int \frac{\ln^2 x}{x} dx$ | e) $\int \frac{\ln^3 x}{x} dx$ | f) $\int \frac{\sqrt{\ln x}}{x} dx$ |
| g) $\int \frac{\cos x}{\sin^2 x} dx$ | h) $\int \frac{\sin x}{\cos^2 x} dx$ | i) $\int \frac{\cos x}{\sin^{1997} x} dx$ |
| j) $\int \frac{\tan x}{\cos^2 x} dx$ | k) $\int \frac{\tan^2 x}{\cos^2 x} dx$ | l) $\int \frac{\sqrt{\tan x}}{\cos^2 x} dx$ |

546. Leia integraal ositi integreerimise meetodil.

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|-------------------------------|-----------------------------|--------------------------------|
| a) $\int x \ln x dx$ | b) $\int x \cdot \cos x dx$ | c) $\int x \cdot e^x dx$ |
| d) $\int x \cdot \sin 2x dx$ | e) $\int x^2 \cdot e^x dx$ | f) $\int \sqrt{x} \ln x dx$ |
| g) $\int \ln(x^2+1) dx$ | h) $\int \ln(x+3) dx$ | i) $\int x^2 \cdot \sin x dx$ |
| j) $\int e^x \cdot \cos x dx$ | k) $\int x \cdot a^x dx$ | l) $\int x \cdot \arctan x dx$ |

547. Leia integraal, kasutades näidatud muutujavahetust.

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|---------------------------------------|-----------------------|---------------------------------|-------------------------|
| a) $\int \cos(7-5x) dx$ | võttes $t = 7-5x$; | b) $\int (7-5x)^{10} dx$ | võttes $t = 7-5x$; |
| c) $\int x \cdot e^{x^2} dx$ | võttes $t = x^2$; | d) $\int e^{\sqrt{x}} dx$ | võttes $t = \sqrt{x}$; |
| e) $\int \frac{dx}{x^2 \sqrt{1-x^2}}$ | võttes $x = \sin t$; | f) $\int \frac{\ln x}{x} dx$ | võttes $t = \ln x$; |
| g) $\int \frac{x dx}{x^2+4}$ | võttes $t = x^2+4$; | h) $\int \frac{dx}{\sqrt{1-x}}$ | võttes $t = 1-x$; |

548. Leia integraal, kasutades sobivat muutujavahetust.

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|-----------------------------------|-------------------------------------|-------------------------------------|
| a) $\int \sin(5x-4) dx$ | b) $\int \cos(7-3x) dx$ | c) $\int (2x+9)^{100} dx$ |
| d) $\int (5x-4)^5 dx$ | e) $\int (7-3x)^2 dx$ | f) $\int \sin(2x+9) dx$ |
| g) $\int e^{5x-4} dx$ | h) $\int 10^{7-3x} dx$ | i) $\int 10^{2x+9} \ln 10 dx$ |
| j) $\int \frac{dx}{\cos^2(5x-4)}$ | k) $\int \frac{dx}{\sin^2(7-3x)}$ | l) $\int \frac{dx}{1+(2x+9)^2}$ |
| m) $\int \frac{dx}{\sqrt{5x-4}}$ | n) $\int \sqrt[3]{7-3x} dx$ | o) $\int \frac{dx}{\sqrt[3]{2x+9}}$ |
| p) $\int \frac{dx}{(5x-4)^4}$ | q) $\int \frac{\ln(7-3x)}{7-3x} dx$ | r) $\int (2x+9) dx$ |