MathDF EN

# Integral Calculator: Solve Definite and Indefinite Integrals (Antiderivatives)

Online integral calculator with step-by-step solutions, interactive graphs, and image scanning. Choose solution steps manually. Methods include u-substitution, integration by parts, partial fractions, trigonometric/hyperbolic/logarithmic formulas, polynomial long division, Euler substitution, binomial differentials, Weierstrass substitution, and Ostrogradsky's method. Solve definite and improper integrals using the Fundamental Theorem of Calculus.

INTEGRATION VARIABLE u

UPPER LIMIT 2pi +∞

LOWER LIMIT 0 -∞

Print Screen & CTRL+V

(pi*r_k^2*r_t)/2 =

$$\int_{0}^{2\pi} \frac{\pi r_k^2 r_t}{2} \, \mathrm{d}u$$

▸ Show input functions

Copy solution link

75% 90% 100% 110% 125%

Original integral

$$\int_0^{2\pi} \frac{\pi {r_k}^2 r_t}{2} \, du$$

Value of the integral

$$\pi^2 {r_k}^2 r_t$$

Step-by-step solution

Calculating

$$\int_0^{2\pi} \frac{\pi {r_k}^2 r_t}{2} \, du$$

If the integrand $f(u)$ is continuous on the interval, then by the Fundamental Theorem of Calculus

▶ Show details

$$\int_a^b f(u)\,du = F(u)\Big|_a^b = F(b) - F(a)$$

where

$f(u)$ is continuous on the interval $[a,\ b]$

$F(u)$ is an antiderivative of $f(u)$

$$F(u)\Big|_0^{2\pi} = F(2\pi) - F(0)$$

Antiderivative

$$F(u) = \frac{\pi {r_k}^2 r_t u}{2}$$

Values at bounds:

$$F(2\pi) = \pi^2 {r_k}^2 r_t$$

$$F(0) = 0$$

$$\pi^2 {r_k}^2 r_t$$

Verify by differentiating the antiderivative

Antiderivative

$$F(u) = \int \frac{\pi {r_k}^2 r_t}{2}\,du$$

$$= \frac{\pi {r_k}^2 r_t u}{2} + C$$

Step-by-step solution

Calculating

$$\int \frac{\pi {r_k}^2 r_t}{2}\,du$$

Integral of a constant

$$\frac{\pi {r_k}^2 r_t}{2} \cdot u = \frac{\pi {r_k}^2 r_t u}{2}$$

$\mathrm{d}x \quad \pi \quad C$

# Vorlage (PDF) ansel

Flip Format PDF

C =

Plot:

- [x] $f(x)$
- [x] $F(x)$

$$\int f(x)\,\mathrm{d}x = F(x)$$

Values:

$x =$

$f(x) =$

$F(x) =$

Zoom (wheel or gesture):

- [x] X : Y
- [ ] X
- [ ] Y

1 : 1

x=0, y=0

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