Integrationsregeln

- **hold(int(k*f(x), x))=int(k*f(x), x);**
  hold(int(f(x)+g(x), x))=int(f(x)+g(x), x);

$$\int k \cdot f(x)\ dx = \int k \cdot f(x)\ dx$$

$$\int (f(x) + g(x))\ dx = \int (f(x) + g(x))\ dx$$

$$\int 1\ dx = x$$

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

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

$$\int x^3\ dx = \frac{x^4}{4}$$

$$\int x^4\ dx = \frac{x^5}{5}$$

$$\int \sin(x)\ dx = -\cos(x)$$

$$\int \cos(x)\ dx = \sin(x)$$

$$\int \tan(x)\ dx = -\ln(\cos(x))$$

$$\int e^x\ dx = e^x$$

$$\int \ln(x)\ dx = x \cdot \ln(x) - x$$

$$\int \frac{1}{x}\ dx = \ln(x)$$

$$\int \frac{1}{x^k}\ dx = -\frac{x}{x^k \cdot (k-1)}$$

$$\int_a^b f(x)dx = \left[F(x)\right]_a^b = F(b) - F(a) \quad mit \quad F'(x) = f(x)$$

$$\int_a^b 1\, dx = b - a$$

$$\int_a^b x\, dx = \frac{b^2}{2} - \frac{a^2}{2}$$

$$\int_a^b x^2\, dx = \frac{b^3}{3} - \frac{a^3}{3}$$

$$\int_a^b \sin(x)\, dx = \cos(a) - \cos(b)$$

$$\int_0^{\pi}(\sin x + x)\,dx = \left[-\cos x + \tfrac{1}{2}x^2\right]_0^{\pi}$$
$$= -\cos\pi + \tfrac{1}{2}\pi^2 - (-\cos 0 + 0)$$
$$= +1 + \tfrac{1}{2}\pi^2 + 1$$
$$= 2 + \tfrac{1}{2}\pi^2$$

Teppich-Abroll-Funktion =Integralfunktion der oberen Grenze

- `hold(int(t^2,t=0..x))=int(t^2, t=0..x);`

$$\int_0^x t^2\, dt = \frac{x^3}{3}$$

$$\int_a^x f(t)\,dt = \left[F(t)\right]_a^x = F(x) \quad mit$$
$$F'(t) = f(t)$$
$$und \quad F(a) = 0$$

- `parg:=plot::Function2d(x^2,x=-1..5,`
     `LineColor=[1,0,0], LineWidth=0.8):`
- `pari:=plot::Integral(plot::Function2d(x^2,x=0..4)):`
- `plot(pari,parg)`

Exact: 21.33
Integral: 21.33