```
> Diff(exp(x^2), x):%=value(%);
```

$$\frac{d}{dx} e^{x^2} = 2\,x\,e^{x^2}$$

```
> Diff(exp(x^2), x$2):%=value(%);
```

$$\frac{d^2}{dx^2} e^{x^2} = 2\,e^{x^2} + 4\,x^2\,e^{x^2}$$

```
> alias(y=y(x));
```

$$y$$

```
> eq:=x^2+y^2=c;
```

$$eq := x^2 + y^2 = c$$

```
> dydx:=solve(diff(eq,x), diff(y,x));
```

$$dydx := -\frac{x}{y}$$

```
> alias(y=y);
> Diff(exp(a*x*y^2), x,y$2): %=value(%);
```

$$\frac{\partial^3}{\partial y^2\,\partial x} e^{a x y^2} = 2\,a\,e^{a x y^2} + 10\,a^2\,y^2\,x\,e^{a x y^2} + 4\,a^3\,y^4\,x^2\,e^{a x y^2}$$

```
> Integrate(x/(x^3+1),x): %=value(%);
```

$$\int \frac{x}{x^3+1}\,dx = -\frac{1}{3}\ln(x+1) + \frac{1}{6}\ln(x^2-x+1) + \frac{1}{3}\sqrt{3}\arctan\left(\frac{1}{3}(2\,x - 1)\sqrt{3}\right)$$

```
> Integrate(x/(x^3+1),x=1..2): %=value(%);
```

$$\int_1^2 \frac{x}{x^3+1}\,dx = \frac{1}{3}\ln(2) + \frac{1}{18}\sqrt{3}\,\pi - \frac{1}{6}\ln(3)$$

```
> Sum(k^7, k=1..20): %=value(%);
```

$$\sum_{k=1}^{20} k^7 = 3877286700$$

```
> t:=taylor(sin(tan(x))-tan(sin(x)), x=0, 13);
```

$$t := -\frac{1}{30}x^7 - \frac{29}{756}x^9 - \frac{1913}{75600}x^{11} + O(x^{13})$$

```
> Limit((x^2-1)/(2*x^2-x-1),x=1): %=value(%);
```

$$\lim_{x\to 1} \frac{x^2-1}{2\,x^2-x-1} = \frac{2}{3}$$

```
> Limit( cos(x)^(1/x^3), x=0, right): %=value(%);
```

$$\lim_{x\to 0+} \cos(x)^{\frac{1}{x^3}} = 0$$

```
diff(e^x^2,x)
```
$$2\,xe^{(x^2)}$$

```
diff(e^x^2,x,2)
```
$$4\,x^2e^{(x^2)}+2\,e^{(x^2)}$$

```
y=function('y')(x);dy=y.diff(x);dy
```
$$\frac{\partial}{\partial x}y\left(x\right)$$

```
var('c')
```
$$c$$

```
eq=x^2+y^2==c;eq
```
$$x^2+y\left(x\right)^2=c$$

```
solve(eq.diff(x),dy)
```
$$[\frac{\partial}{\partial x}y\left(x\right)=-\frac{x}{y\left(x\right)}]$$

```
reset();var('y,a,k')
```
$$(y,\,a)$$

```
diff(e^(a*x*y^2),x,1,y,2)
```
$$4\,a^3x^2y^4e^{(axy^2)}+10\,a^2xy^2e^{(axy^2)}+2\,ae^{(axy^2)}$$

```
integrate(x/(x^3+1),x)
```
$$\frac{1}{3}\,\sqrt{3}\arctan\left(\frac{1}{3}\,\sqrt{3}(2\,x-1)\right)+\frac{1}{6}\,\log\left(x^2-x+1\right)-\frac{1}{3}\,\log\left(x+1\right)$$

```
integrate(x/(x^3+1),x,1,2)
```
$$\frac{1}{18}\,\sqrt{3}\pi-\frac{1}{6}\,\log\left(3\right)+\frac{1}{3}\,\log\left(2\right)$$

```
sum(k^7,k,1,20)
```
$$3877286700$$

```
taylor(sin(tan(x))-tan(sin(x)),x,0,11)
```
$$-\frac{1913}{75600}\,x^{11}-\frac{29}{756}\,x^9-\frac{1}{30}\,x^7$$

```
limit((x^2-1)/(2*x^2-x-1),x=1)
```
$$\frac{2}{3}$$

```
limit(cos(x)^(1/x^3), x=0, dir='+')
```
$$0$$