

## Nekonečné rady

**Príklad** Určme súčet radov:

a)  $\sum_{k=1}^{\infty} \left(\frac{1}{2}\right)^{k-1}$ , b)  $\sum_{k=1}^{\infty} x^k$ , c)  $\sum_{n=1}^{\infty} \frac{1}{n^2}$ .

*Riešenie.* Použitím programu MAXIMA dostávame:

a)

```
(%i1) sum((1/2)^(k-1), k, 1, inf), simpsum;
(%o1) 2
```

b)

```
(%i2) sum(x^k, k, 1, inf), simpsum;
Is |x| - 1 positive, negative, or zero? negative;
```

```
(%o2) 
$$\frac{x}{1-x}$$

```

```
c) (%i3) sum(1/(n^2), n, 1, inf), simpsum;
(%o3) %pi^2/6
```

**Príklad** Nájdime prvých osem členov rozvoja funkcie  $f_1(x) = \cos x$  a  $f_2(x) = \frac{1 - \cos x}{x^2}$  do

Taylorovho radu v okolí bodu  $x=0$ . Výsledok znázorníme graficky.

*Riešenie.* Použitím programu MAXIMA dostávame:

```
(%i5) taylor(cos(x), x, 0, 8);
```

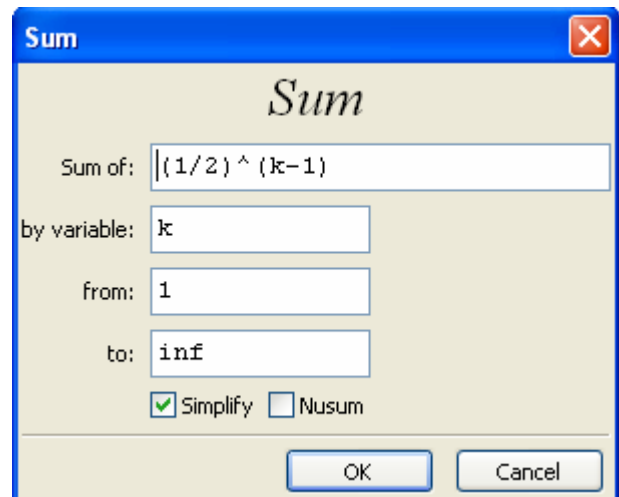
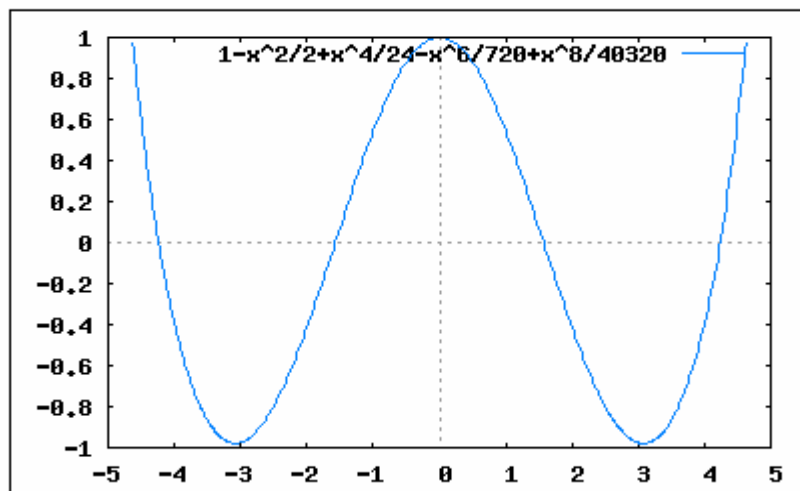
```
(%o5) 
$$1 - \frac{x^2}{2} + \frac{x^4}{24} - \frac{x^6}{720} + \frac{x^8}{40320} + \dots$$

```

```
(%i6) wxplot2d([%], [x,-5,5], [y,-1,1],
[nticks,50]);
```

Output file "C:/Documents and Settings/PC/maxout.png".

(%o6)



```
(%i7) taylor((1-cos(x))/x^2,x,0,8);
```

```
(%o7)  $\frac{1}{2} - \frac{x^2}{24} + \frac{x^4}{720} - \frac{x^6}{40320} + \frac{x^8}{3628800} + \dots$ 
```

```
(%i8) wxplot2d([%], [x,-5,5], [y,-0.5,0.5],  
[nticks,50]);
```

Output file "C:/Documents and Settings/PC/maxout.png".

```
(%o8)
```

