

Odhad chyby pro Tayloruv polynom

```
> n:=10; a:=-1; b:=1;
```

$n := 10$

$a := -1$

$b := 1$

```
> f:=x->sin(5*x);
```

$f := x \rightarrow \sin(5x)$

```
> mnohoclen:=proc(k) convert(series(f(x),x=0,k),polynom); end:
```

```
> mnohoclen(n);
```

$$5x - \frac{125}{6}x^3 + \frac{625}{24}x^5 - \frac{15625}{1008}x^7 + \frac{390625}{72576}x^9$$

```
> p:= z-> subs(x=z,mnoclen(n));
```

$p := z \rightarrow \text{subs}(x=z, \text{mnoclen}(n))$

```
> p(x);
```

$$5x - \frac{125}{6}x^3 + \frac{625}{24}x^5 - \frac{15625}{1008}x^7 + \frac{390625}{72576}x^9$$

```
> p(1);
```

$\frac{6505}{72576}$

$\frac{6505}{72576}$

```
> df:=proc(k) simplify(eval(diff(f(x),x$(k+1)),x=y));end:
```

```
> df(1);
```

$-25 \sin(5y)$

```
> zbytek := k -> df(k)*x^(k+1)/(k+1)!;
```

$$zbytek := k \rightarrow \frac{df(k) x^{(k+1)}}{(k+1)!}$$

```
>
```

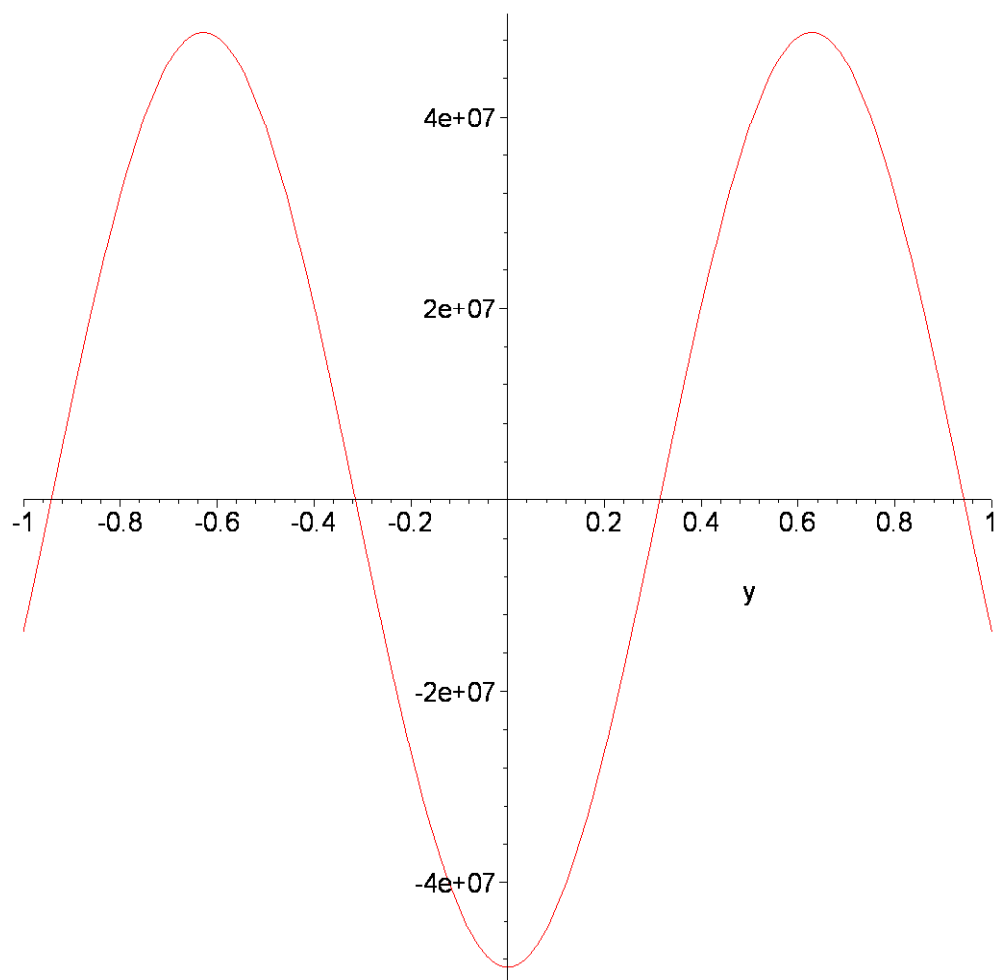
```
> df(n);
```

$-48828125 \cos(5y)$

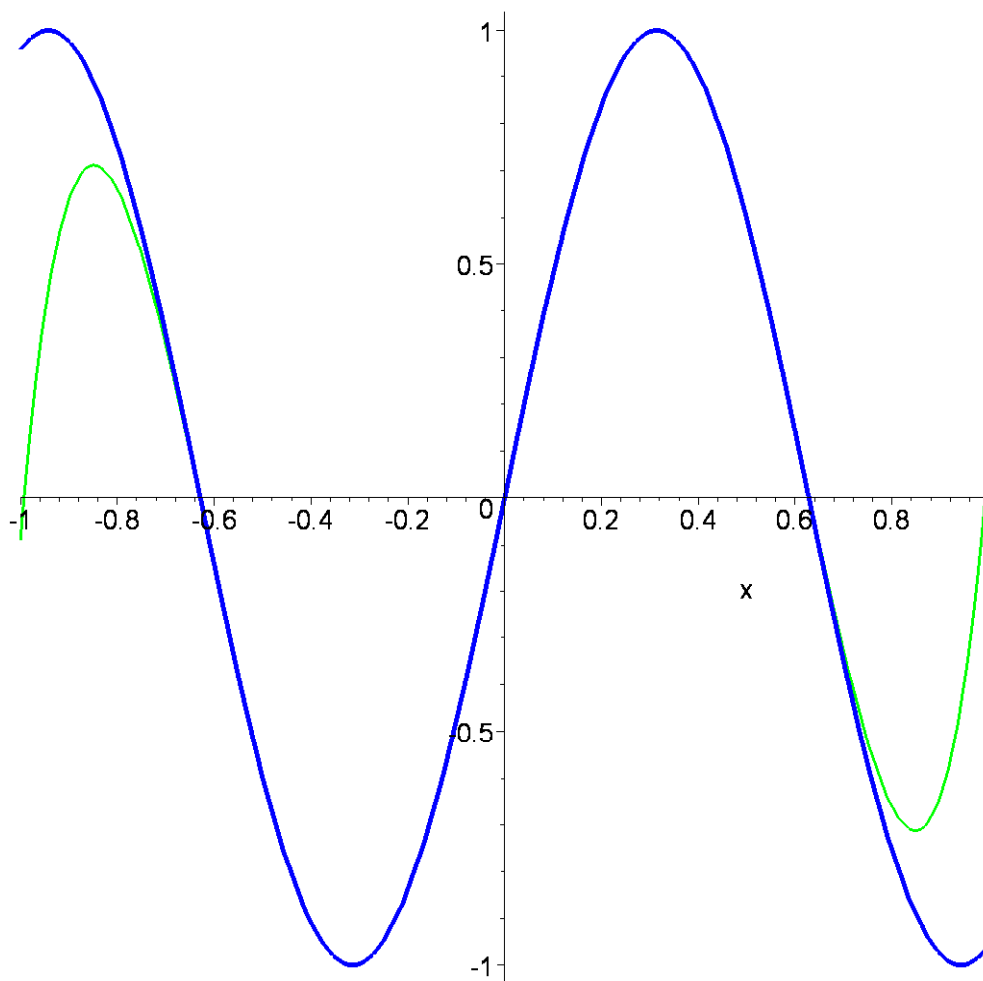
```
> zbytek(n);
```

$$-\frac{1953125}{1596672} \cos(5y) x^{11}$$

```
> plot(df(n), y= a..b);
```



```
> plot([f(x),mnohoclen(n)], x=a..b,  
color=[blue,green],thickness=[5,3]);
```



```
> solve([diff(df(n), y)=0, y>a, y<b], y);
           {y=0}
```

```
> chyba:= x-> f(x)-p(x);
           chyba := x → f(x) - p(x)
```

```
> chyba(0);
           0
```

```
> E:=max(chyba(a), chyba(b), chyba(0));
           E := -sin(5) +  $\frac{6505}{72576}$ 
```

```
> evalf(E);
           1.048554455
```

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>
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>
```

```
> Credit:= "I&C, p. 123" ;
           Credit := "I&C, p. 123"
```

```
>
```

```
>
```