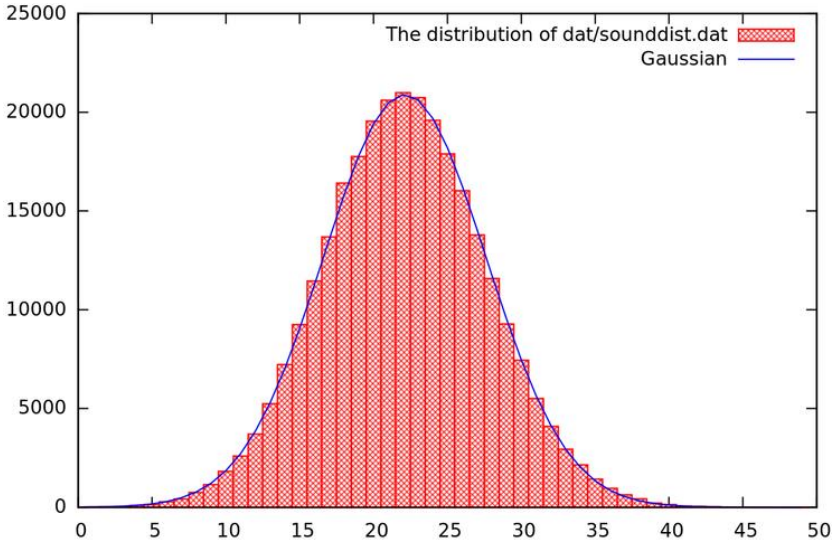
МИЭТ
Национальный исследовательский университет «МИЭТ»
Кафедра ПКИМС

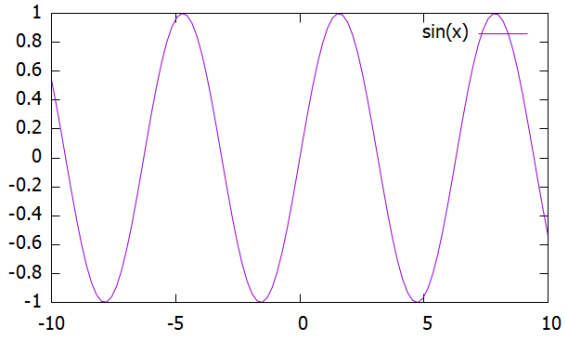
Компьютерные технологии в научных исследованиях

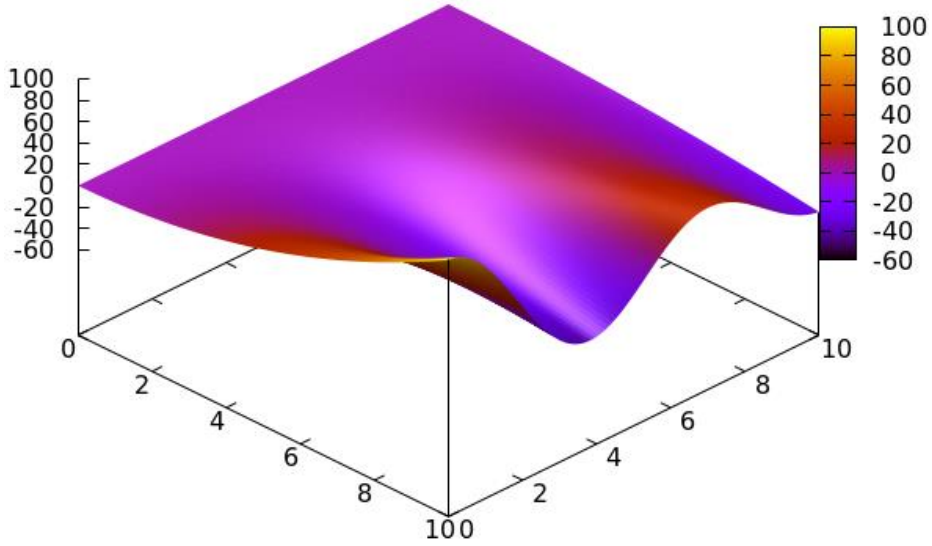
Семинар №6

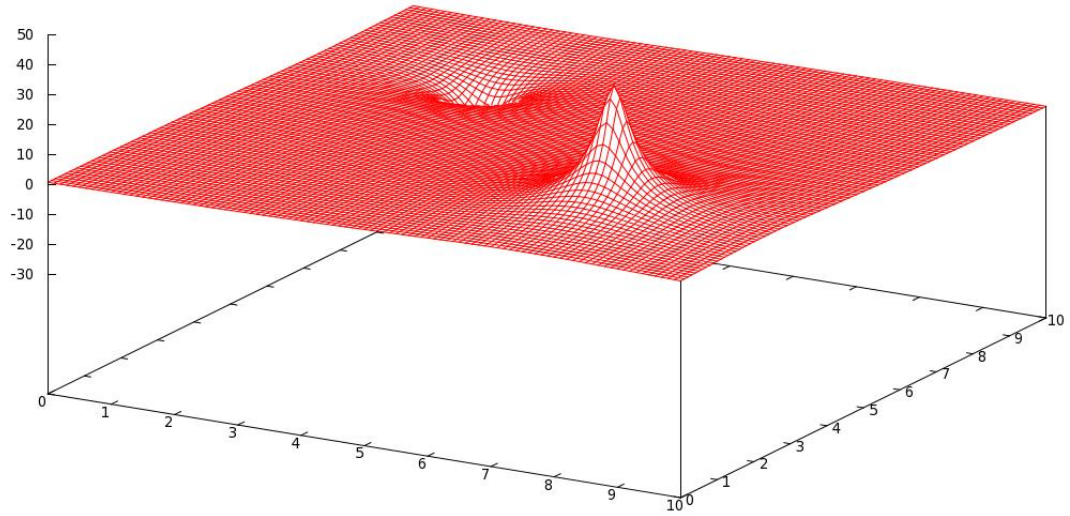
Работа с пакетом gnuplot

Задача визуализации графиков



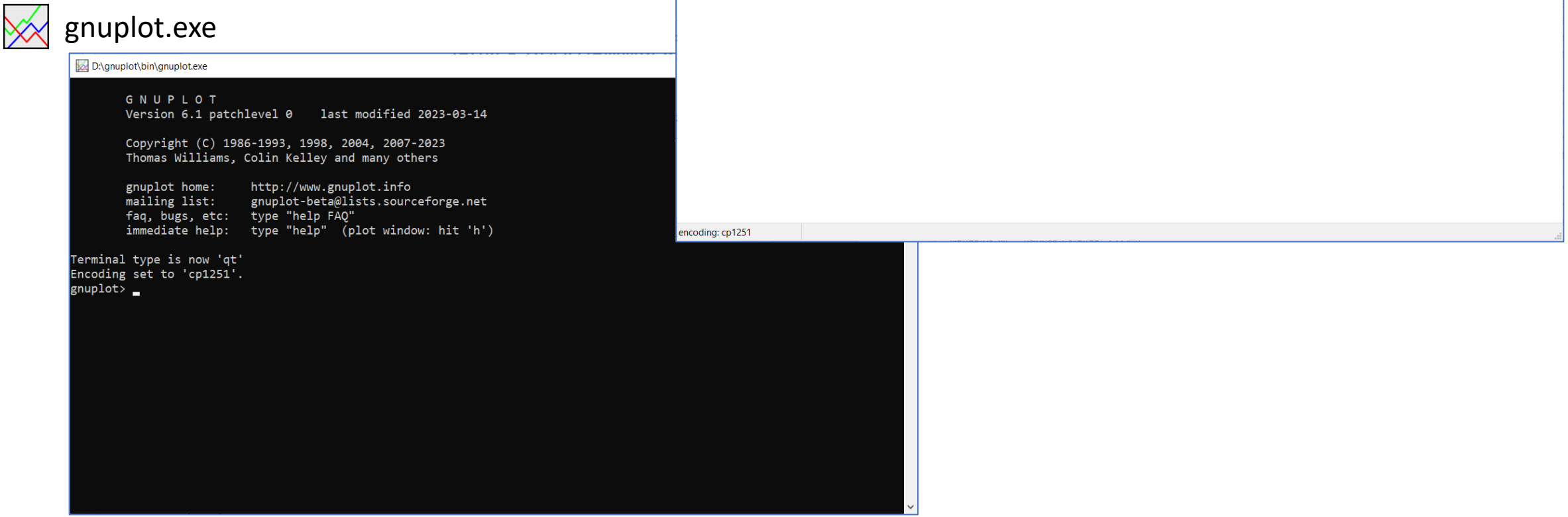






Запуск программы gnuplot

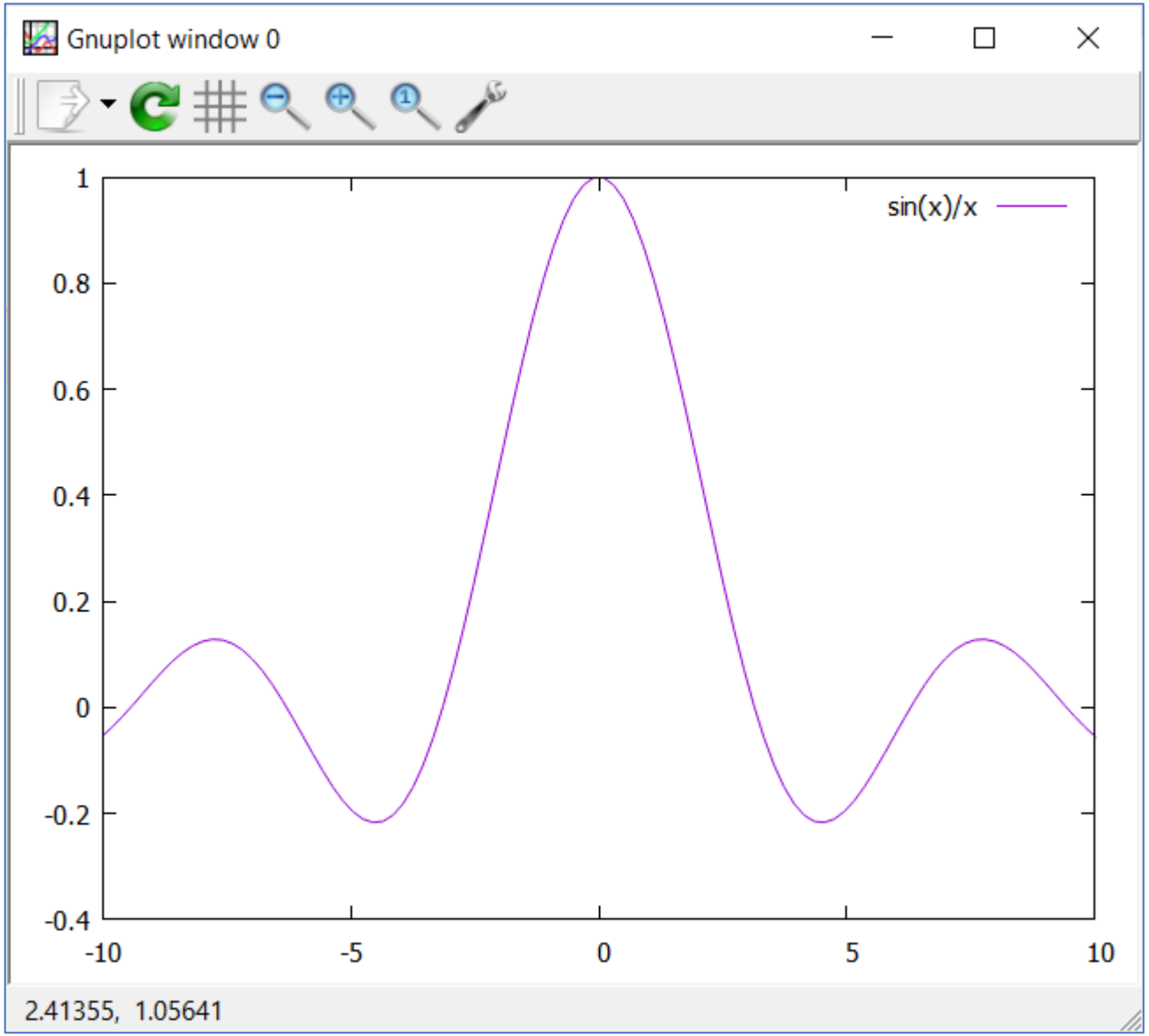
wgnuplot.exe



gnuplot.exe

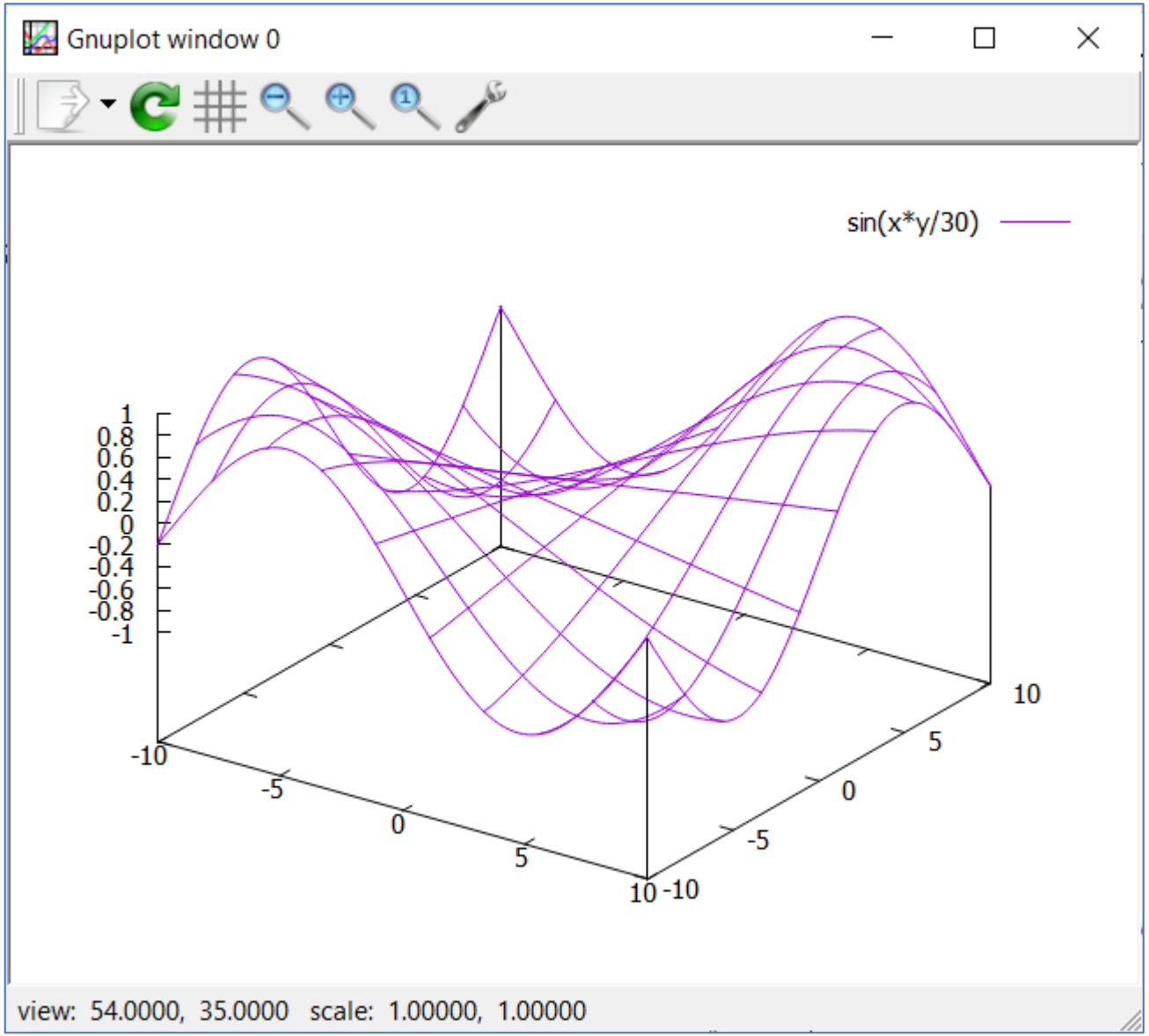
Построение простого 2D-графика

```
> plot sin(x)/x
```



Построение простого 3D-графика

```
> splot sin(x*y/30)
```

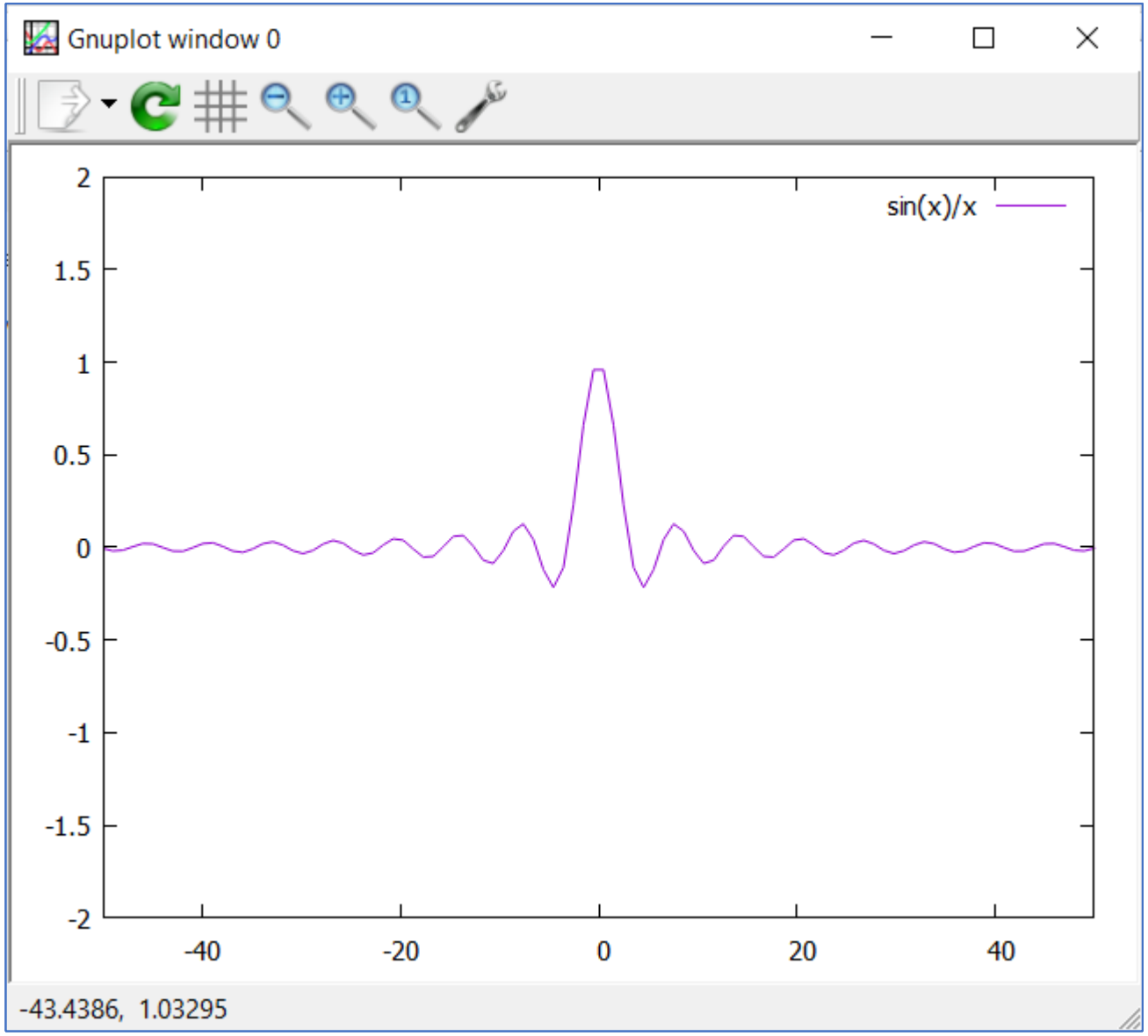


Поддерживаемые функции

abs(x)	absolute value of x, |x|
acos(x)	arc-cosine of x
asin(x)	arc-sine of x
atan(x)	arc-tangent of x
cos(x)	cosine of x, x is in radians.
cosh(x)	hyperbolic cosine of x, x is in radians
erf(x)	error function of x
exp(x)	exponential function of x, base e
inverf(x)	inverse error function of x
invnorm(x)	inverse normal distribution of x
log(x)	log of x, base e
log10(x)	log of x, base 10
norm(x)	normal Gaussian distribution function
rand(x)	pseudo-random number generator
sgn(x)	1 if x > 0, -1 if x < 0, 0 if x=0
sin(x)	sine of x, x is in radians
sinh(x)	hyperbolic sine of x, x is in radians
sqrt(x)	the square root of x
tan(x)	tangent of x, x is in radians
tanh(x)	hyperbolic tangent of x, x is in radians

Управление диапазоном значений

```
> plot sin(x)/x

> plot [-5:5] sin(x)/x

> plot [-5:5] [-10:10] sin(x)/x

> plot [] [-10:10] sin(x)/x

> set xrange [-50:50]
> set yrange [-2:2]
> plot sin(x)/x
```

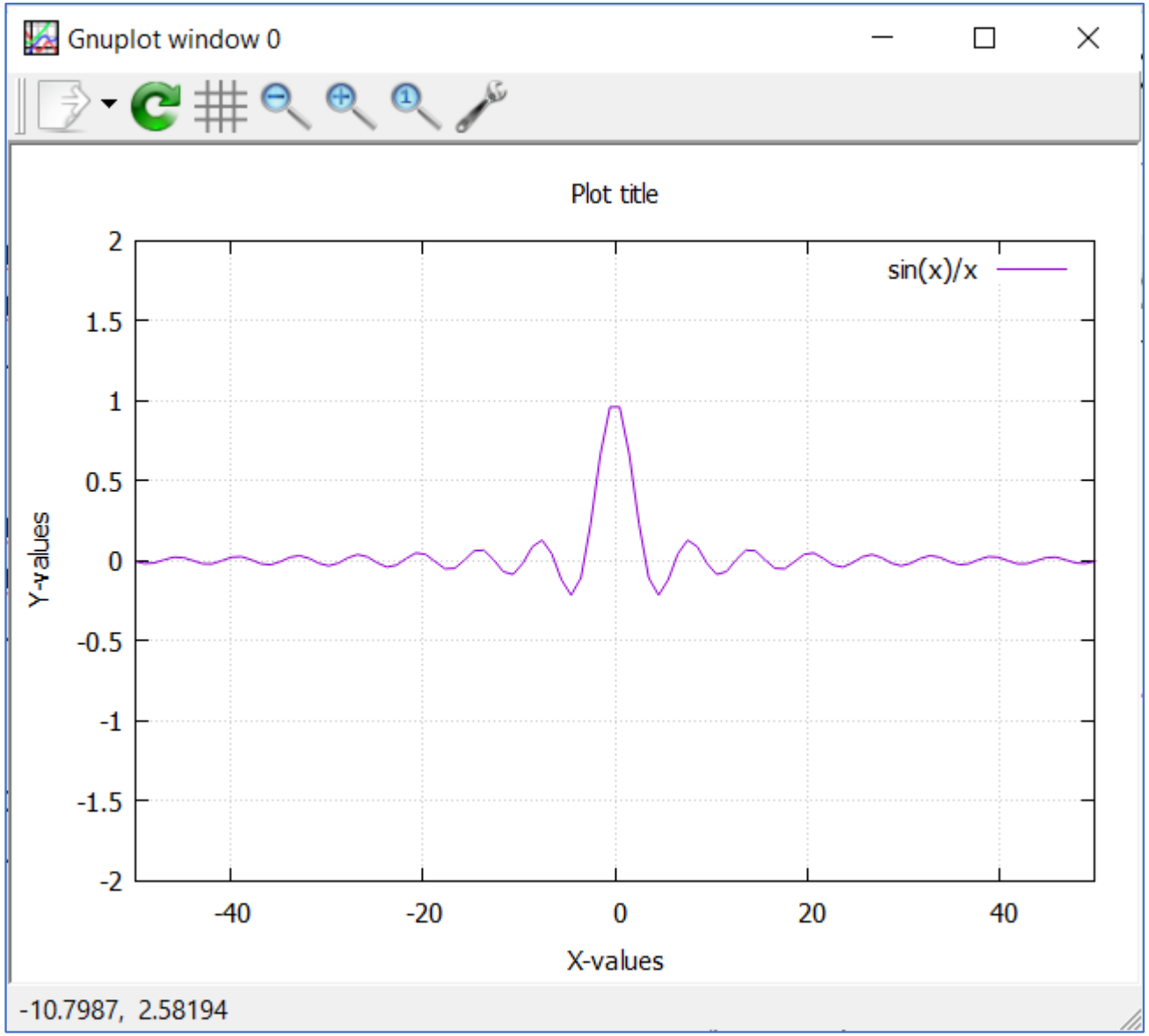


Управление текстовой информацией (1)

```
> set xrange [-50:50]
> set yrange [-2:2]
> plot sin(x)/x
```

```
> set xlabel "X-values"
> set ylabel "Y-values"
> plot sin(x)/x
```

```
> set title "Plot title"
> plot sin(x)/x
```

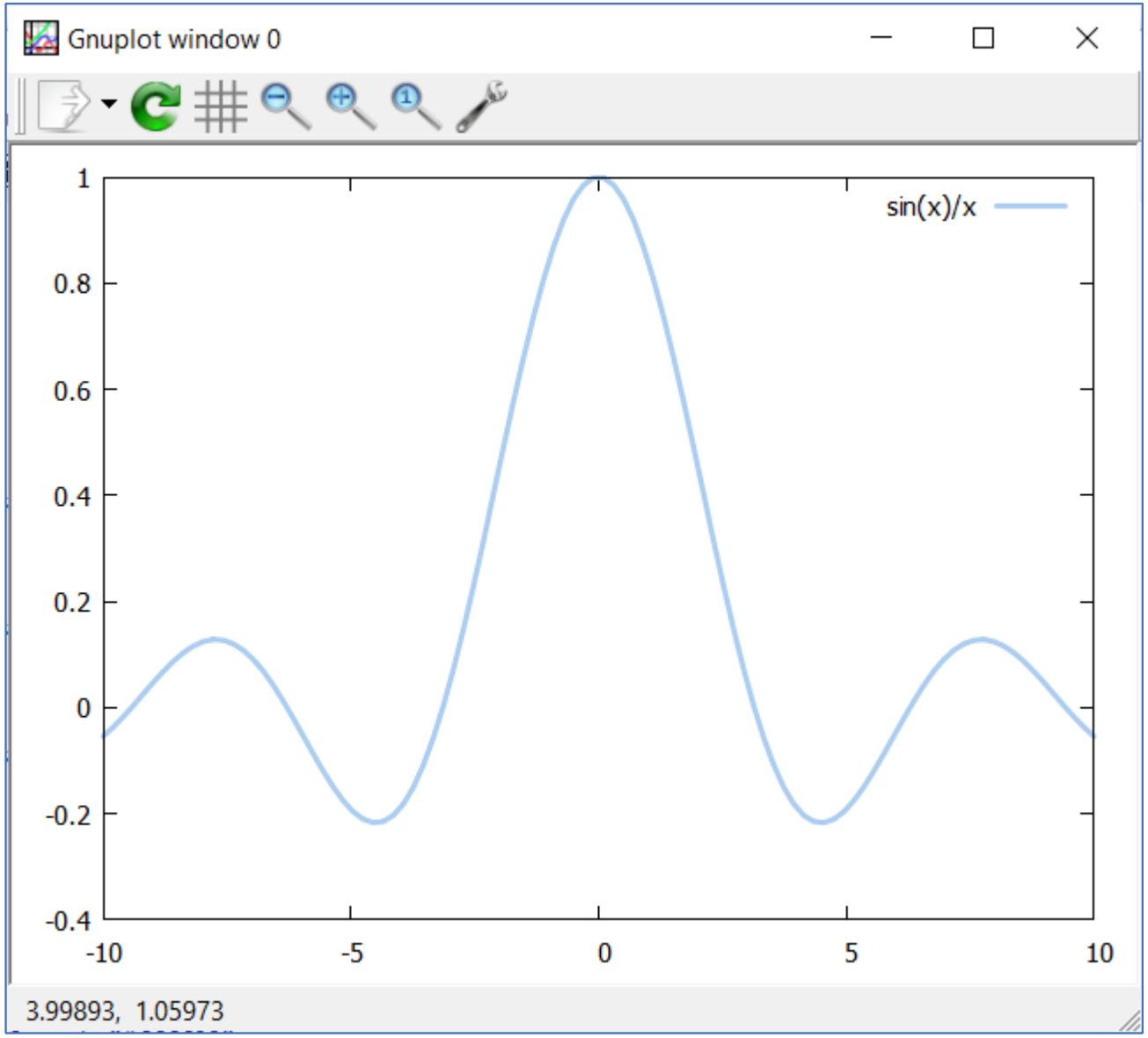


Управление внешним видом графиков (1)

```
> plot sin(x)/x
```

```
> plot sin(x)/x lt rgb "#abcdef"
```

```
> plot sin(x)/x lt rgb "#abcdef"
                      lw  3
```

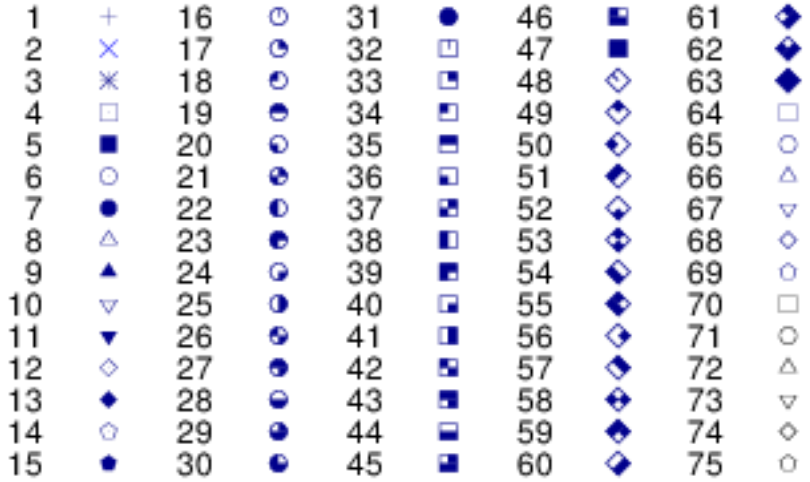


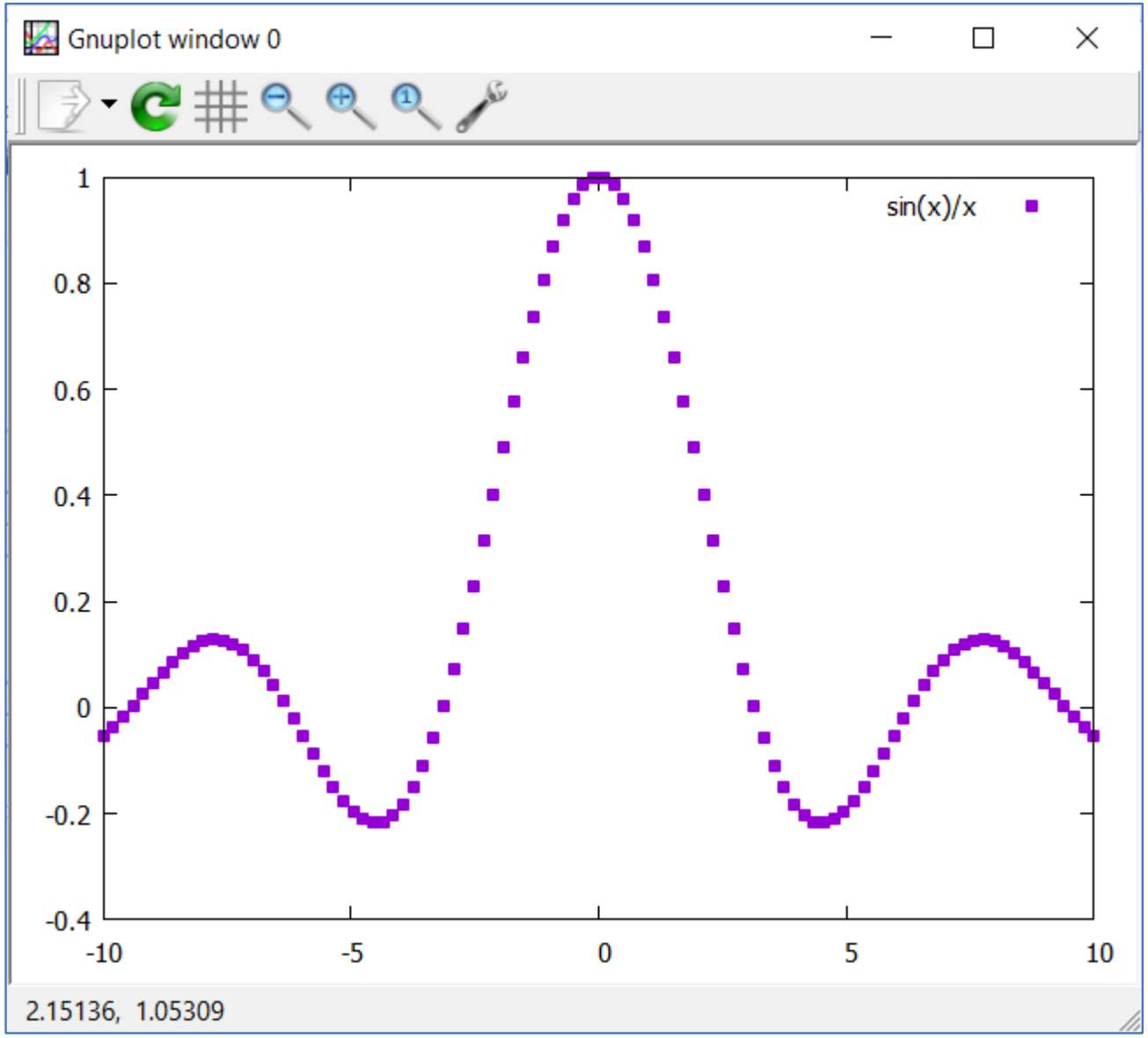
Управление внешним видом графиков (2)

```
> plot sin(x)/x
```

```
> plot sin(x)/x with points
```

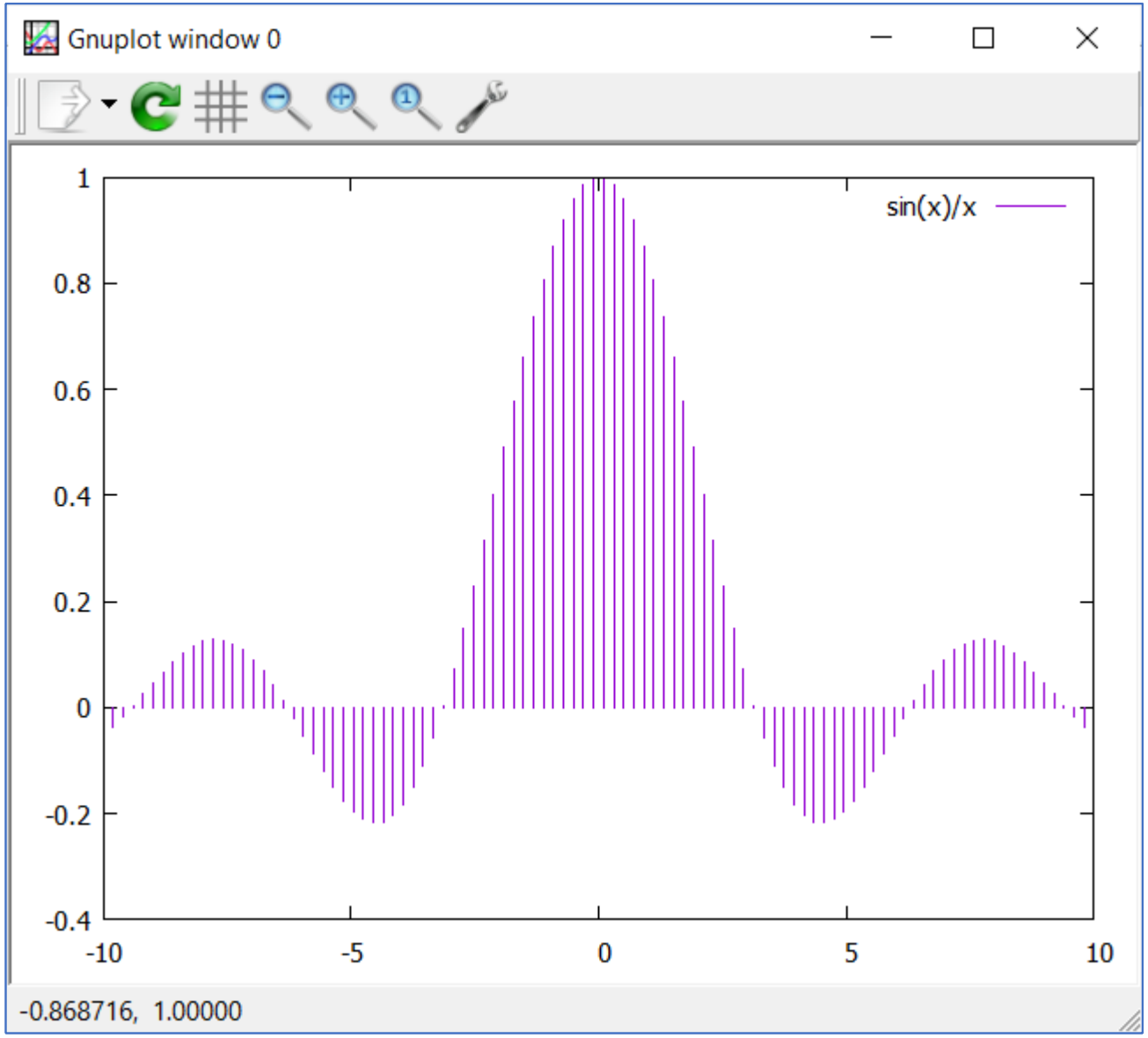
```
> plot sin(x)/x with points
                  pointtype 5
```





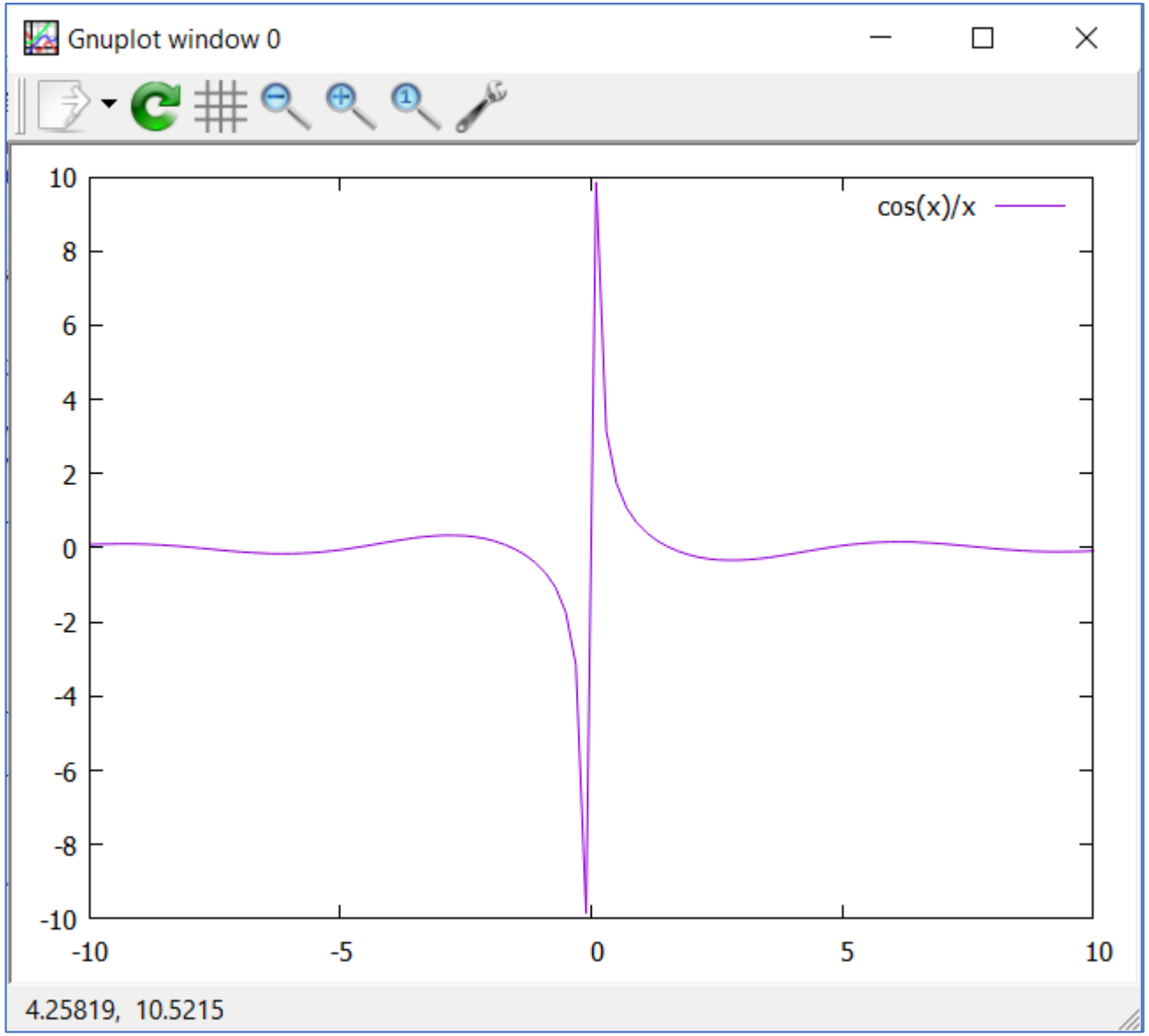
Управление внешним видом графиков (4)

```
> plot sin(x)/x with points

> plot sin(x)/x with lines

> plot sin(x)/x with dots

> plot sin(x)/x with impulses
```



Рисование нескольких графиков (1)

```
> plot sin(x)/x

> plot cos(x)/x
```

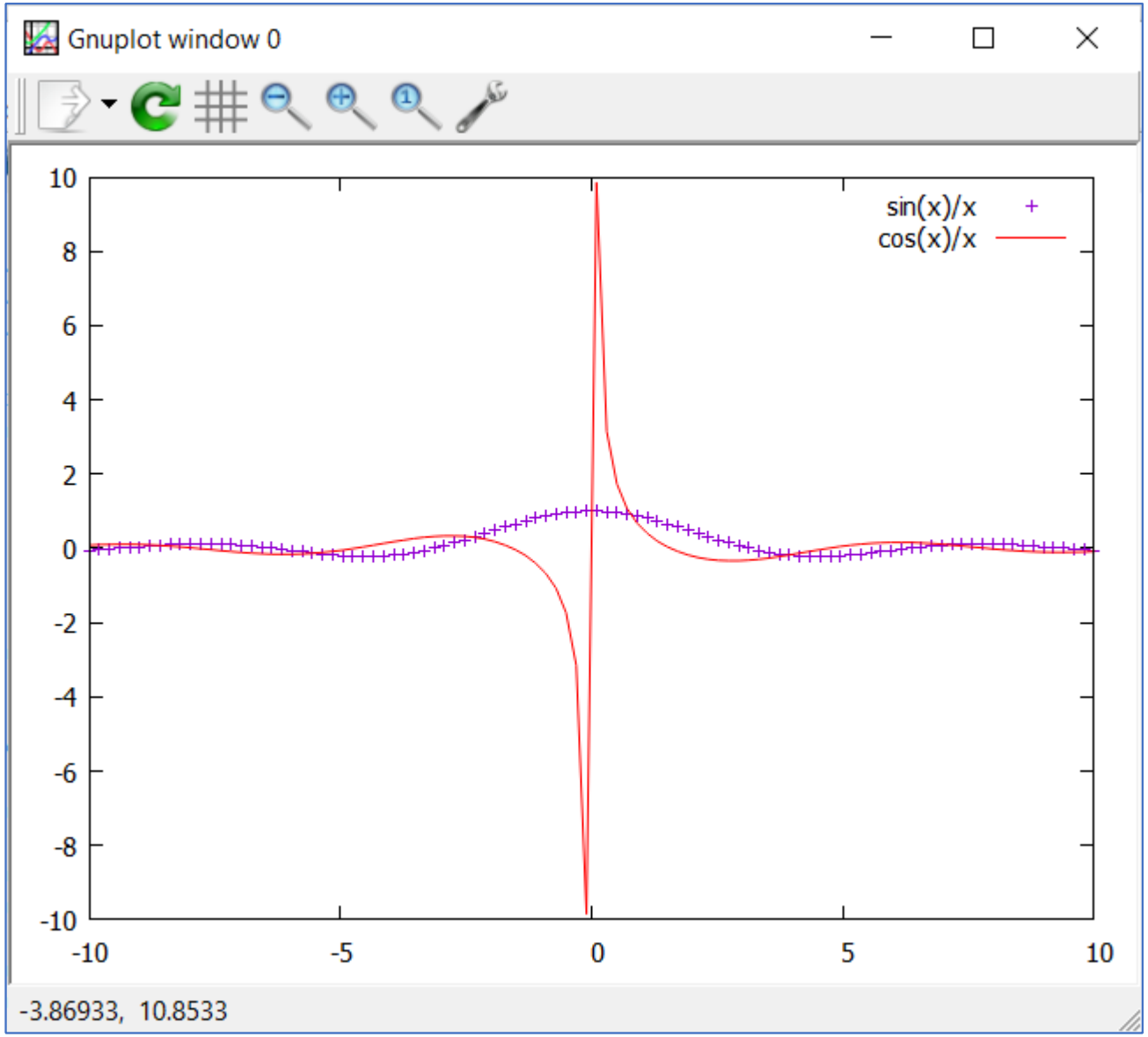


Рисование нескольких графиков (2)

```
> plot sin(x)/x, cos(x)/x
```

```
> plot sin(x)/x with points,
      cos(x)/x
```

```
> plot sin(x)/x with points,
      cos(x)/x lt rgb "#ff0000"
```



Визуализация данных из файлов

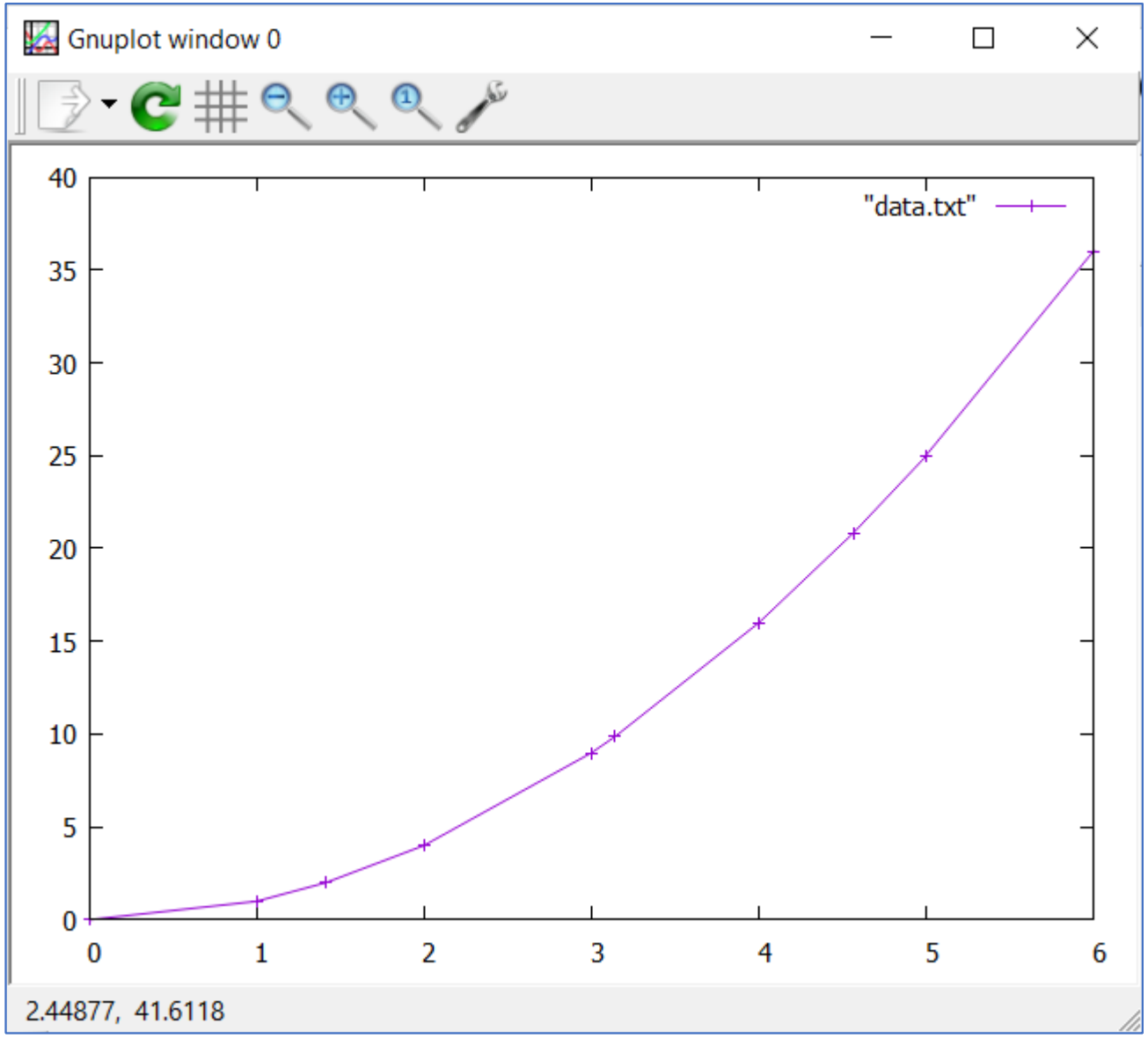
Файл data.txt

```
0         0         0         5
1         1         2         15
1.4142    2         2.8284    1
2         4         4         30
3         9         6         26.46
3.1415    9.8696    6.2832    39.11
4         16        8         20
4.5627    20.8182   9.1254    17
5.0       25.0      10.0      25.50
6         36        12        0.908
```

```
> plot "data.txt"
```

```
> plot "data.txt" with lines
```

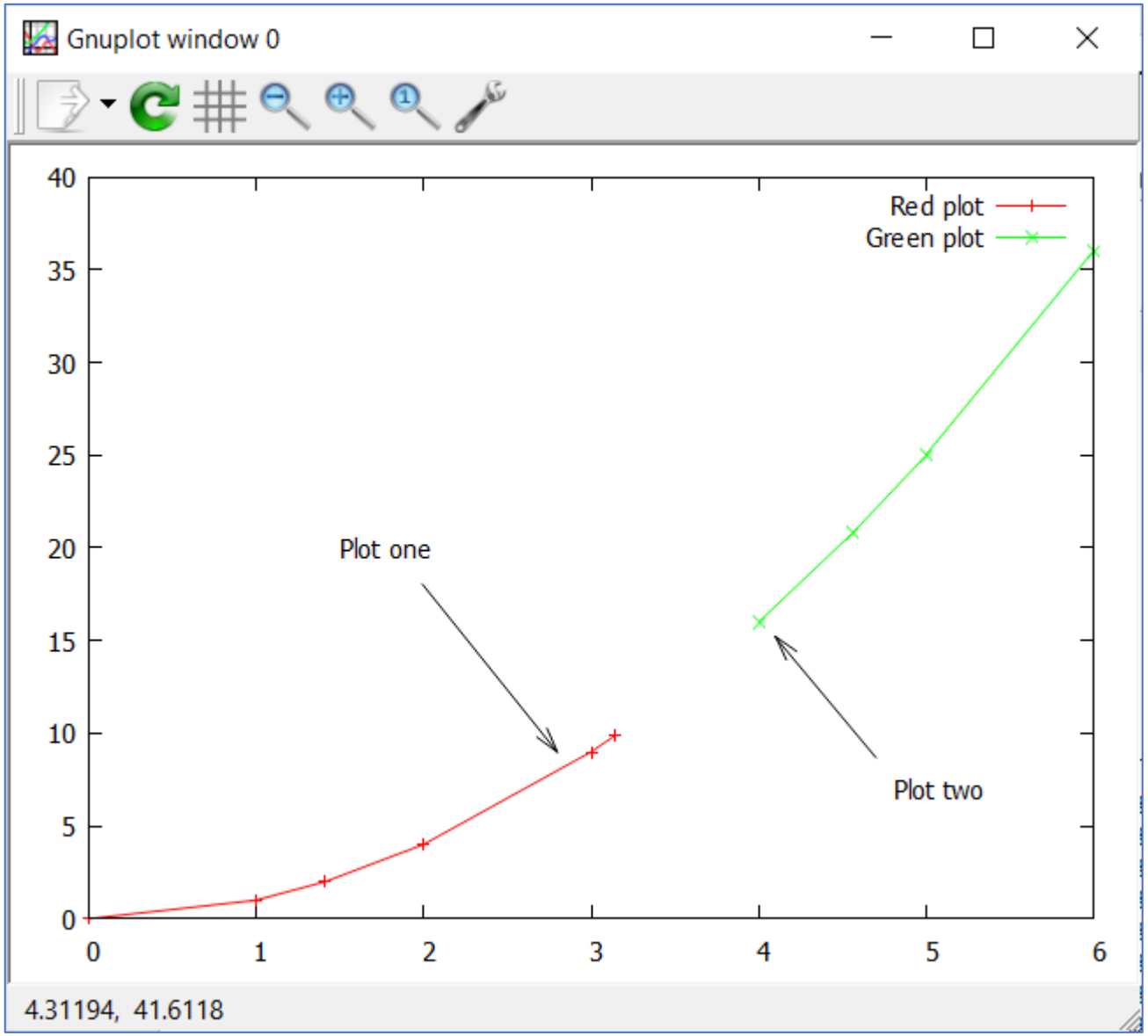
```
> plot "data.txt" with linespoints
```



Добавление элементов на график (2)

```
> plot "data.txt" index 0
                  with linespoint
                  lt rgb "red"
                  title "Red plot",
               "" index 1
                  with linespoint
                  lt rgb "green"
                  title "Green plot"
```

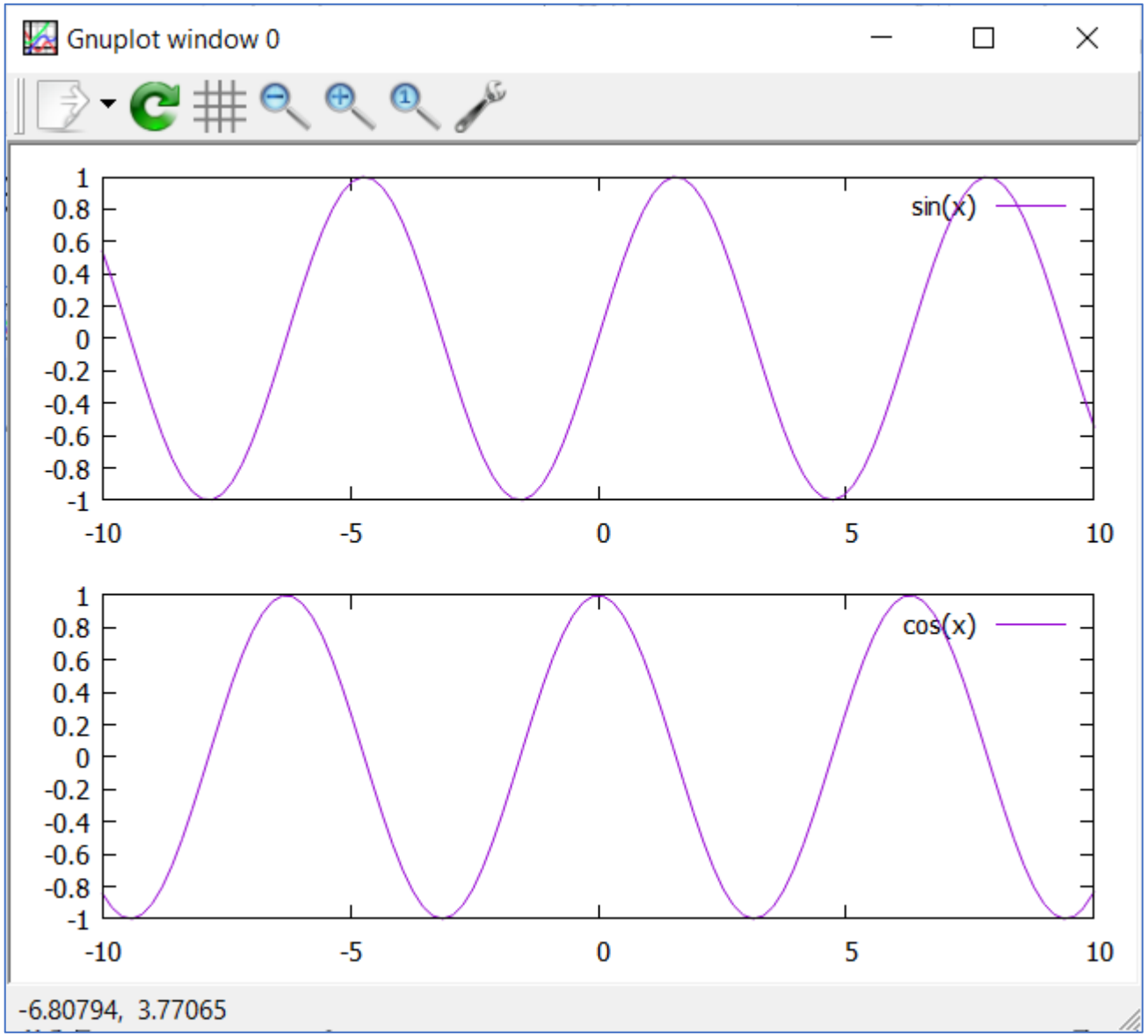
```
> set arrow from <Coold1> to <Coord2>
> replot
```



Несколько раздельных графиков

```
> set multiplot
> set size 1,0.5
> set origin 0.0,0.5
> plot sin(x)
> set origin 0.0,0.0
> plot cos(x)
> unset multiplot
```

```
gnuplot> reset
gnuplot> set multiplot
multiplot> set size 1,0.5
multiplot> set origin 0.0,0.5
multiplot> plot sin(x)
multiplot> set origin 0.0,0.0
multiplot> plot cos(x)
multiplot> unset multiplot
gnuplot> _
```



Визуализация поля данных (1)

```
> splot 'test_35_03.txt' matrix
```