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We will look at both of these methods.

Image files

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JPEG files are used a lot on the web.

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PNG filesizes are usually much bigger than for JPEG.

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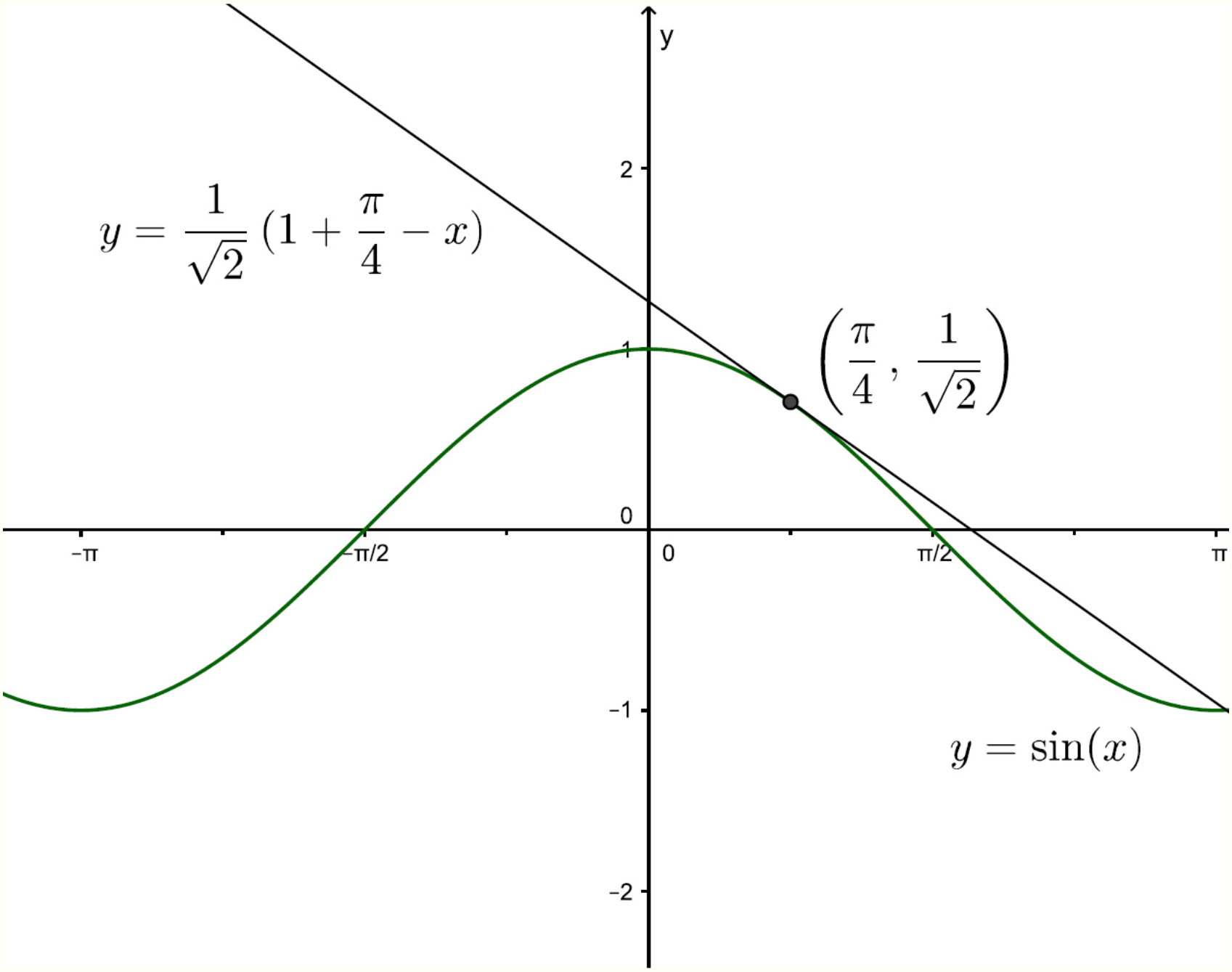
Image size is important in printing. If the image size is not big enough, the result looks pixelated (or blocky) when printed. Standard practice is to use 300 pixels to fill an inch (300dpi) on the page.


y
2
1
0
-1
-2
−π
−π/2
0
π/2
π
$y = \frac{1}{\sqrt{2}}\left(1 + \frac{\pi}{4} - x\right)$
$\left(\frac{\pi}{4}, \frac{1}{\sqrt{2}}\right)$
$y = \sin(x)$

PDF

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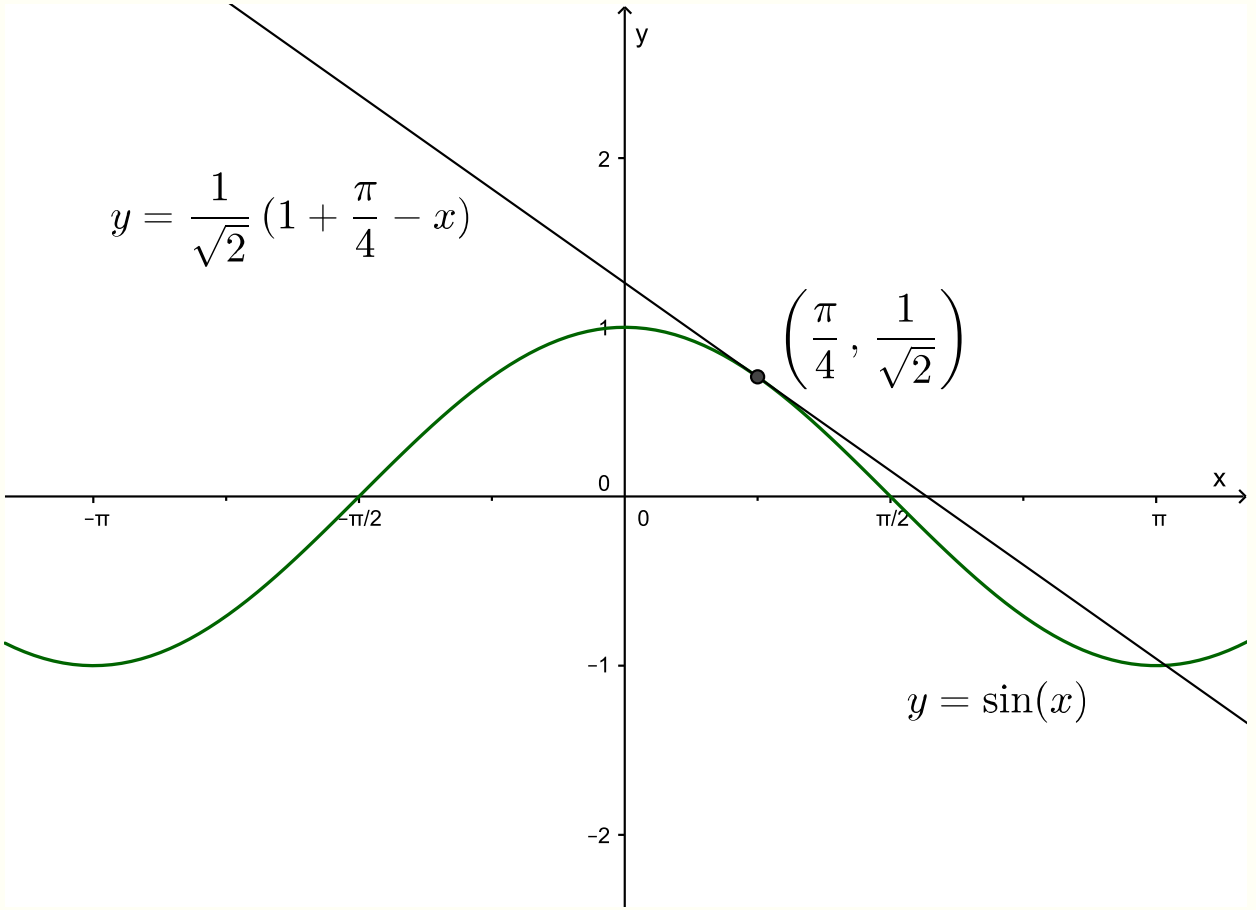
The big advantage of PDF images is *scalability*. PDFs save images as instructions (e.g. 'create a circle of radius $*$ with centre $*$'). Because of this, images created as PDFs often look very smooth.


$y = \frac{1}{\sqrt{2}}(1 + \frac{\pi}{4} - x)$
$\left(\frac{\pi}{4}, \frac{1}{\sqrt{2}}\right)$
$y = \sin(x)$
y
x
2
1
0
-1
-2
−π
−π/2
0
π/2
π

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Opening an image in a graphics program (e.g. Adobe Photoshop) will allow you to choose the file type when saving. There are also websites that will convert images between different filetypes.

(Note: a blocky JPEG image cannot be made into a smooth PDF by changing the filetype; instead you will need to start again.)

Image editing software

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Using the PGFplots package

For creating graphs quickly, by far the best option is using one of LaTeX's packages.

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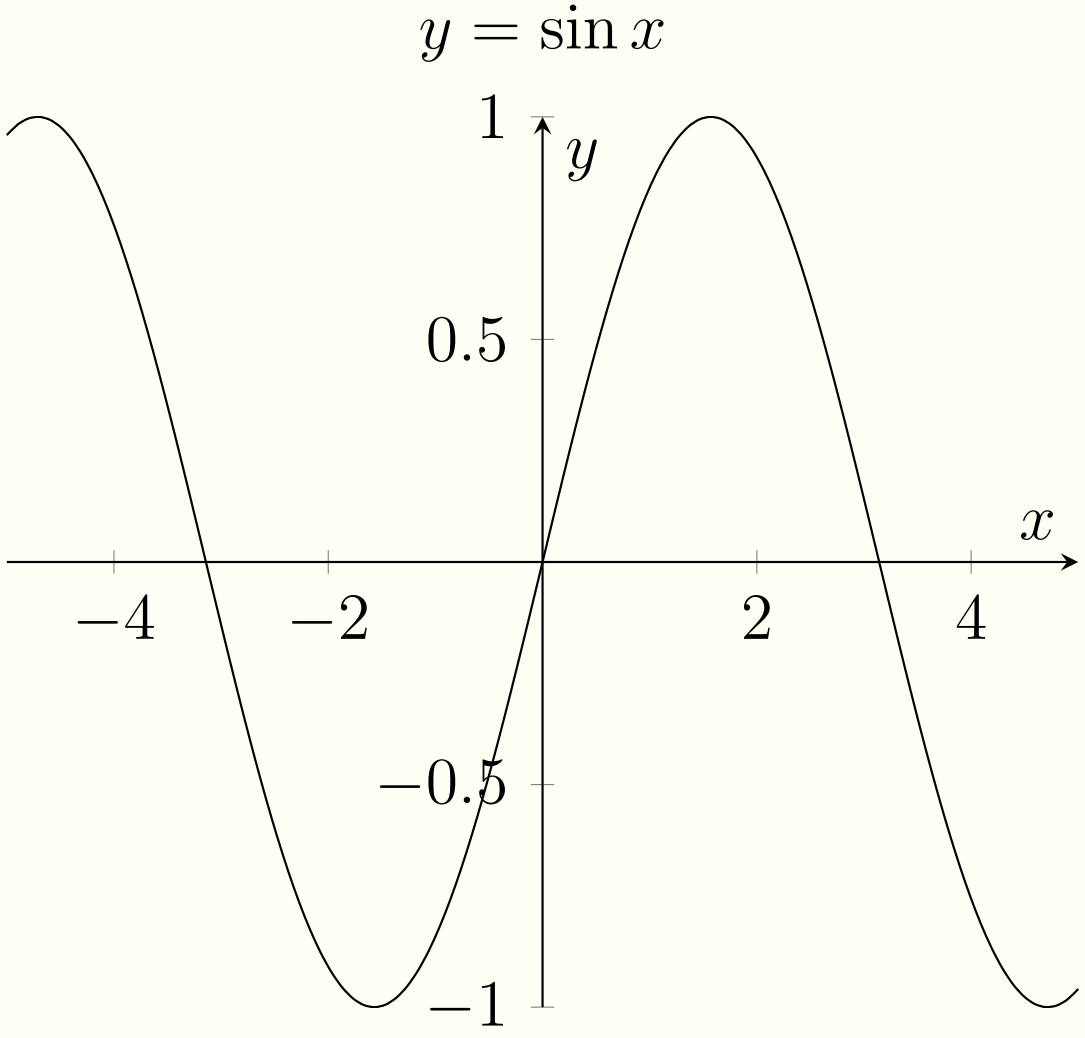
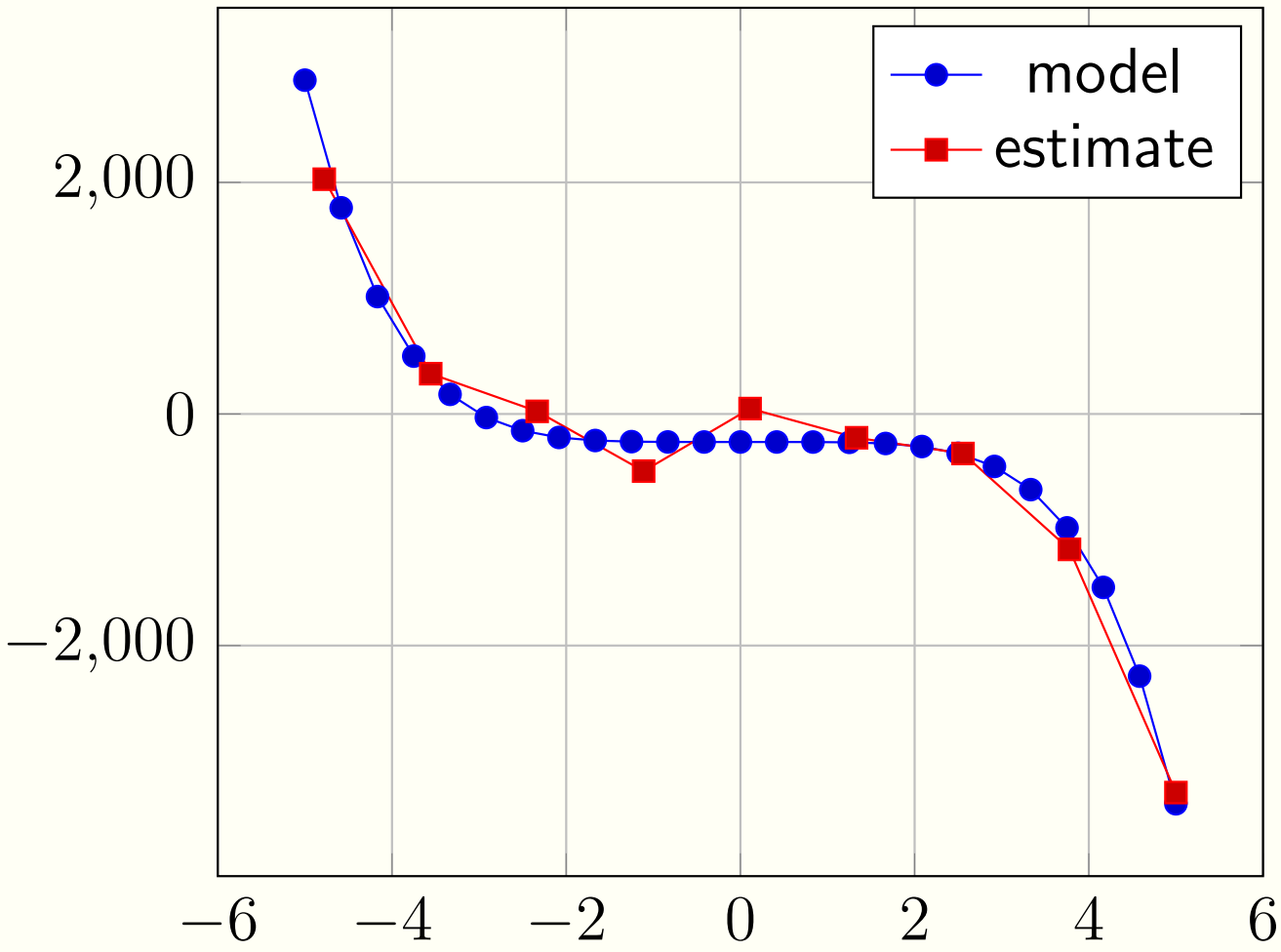


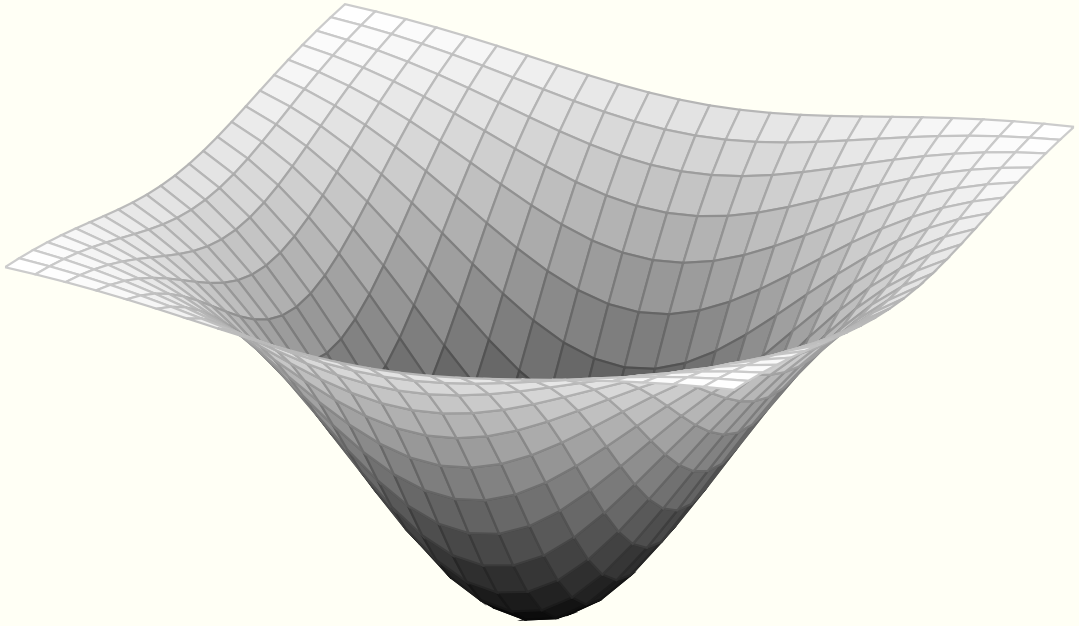
this

this



and even this

and even this



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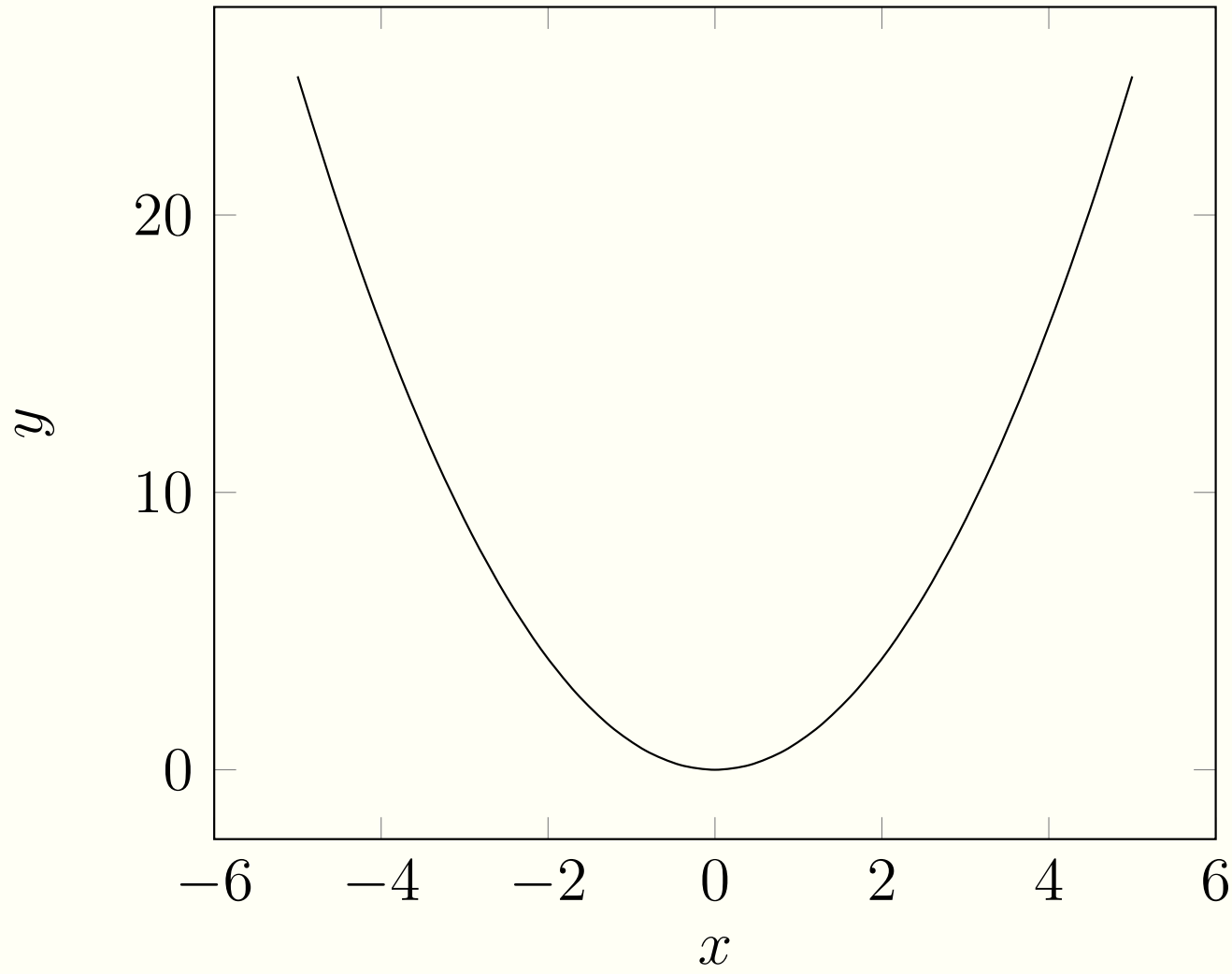
```
\begin{tikzpicture}
\begin{axis}[xlabel=$x$,ylabel=$y$]
\addplot[smooth]{x^2};
\end{axis}
\end{tikzpicture}
```


20
10
0
y
−6
−4
−2
0
2
4
6
x

We'll look at how to use PGFplots more in Lab 4, but lots of examples are available on the PGFplots webpage at `http://pgfplots.sourceforge.net/gallery.html`.

Punctuation

Activity. The document in the Week 4 materials on the course website is in need of a serious proof-reading. Find and correct as many problems as you can (some of which may be LaTeX errors).

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It's not hard to use punctuation correctly once one learns the rules.

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You will find plenty of examples, both good and bad, in these notes.

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A common mistake is to overuse commas, inserting them in places where a pause in speech makes things sound odd. It's best to miss one out if in doubt.

Colons (:)

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Most people use colons correctly, although a common error is to put a (pointless) hyphen afterwards, creating ':-'. Avoid!

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Example.

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We define the function as follows. Given $x \in \mathbb{R}$, let $f(x) = x^2 + 2$.

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- The weather took a turn for the worse; the sky became darker.
- I will look at the problem soon; it's on my to-do list.

Try not to overuse semicolons.

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> *Here is a lesson in creative writing. First rule: Do not use semicolons. All they do is show you've been to college.*

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> *Cut out all those exclamation marks. An exclamation mark is like laughing at your own jokes.*

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A common error is to use an apostrophe in 'its' when used in a possessive way, as in 'The cat chased its tail'. Apostrophes are also unnecessary in ours, yours, his, hers, theirs, and whose, and never needed for plurals. Bad use of apostrophes tends to provoke strong reactions!

Activity. The document in the Week 4 materials on the course website is in need of a serious proof-reading. Find and correct as many problems as you can (some of which may be LaTeX errors).

About Computer Lab 4

In Computer Lab 4 we'll look at the commands needed to include graphics in a document. We'll also look at a few more LaTeX features that come in handy when creating mathematical documents.