Quick and dirty exponential function

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The exponential function

An exponential function, is a function of the form

$$f(x) = ab^x \tag{1}$$

A more interesting case of exponential functions, is the one with the base e, where the exponential function is it's own derivative

$$\frac{d}{dt}e^x = e^x \tag{2}$$

The exponential function can be written as a power series

$$e^x = \sum_{k=0}^{\infty} \frac{x^k}{k!} \tag{3}$$

Implementing the exponential function

There are different ways of how to implement the exponential function, in c code. In math.h there is an exponential function, where we use exp(x), however there could be a reason for not using this implementation, and might want to make your own. One implementation could be the so called quick and dirty (QAD) implementation described below.

```
double ex(double x)
if(x < 0) return 1/ex(-x);
if(x > 1./8) return pow(ex(x/2),2);
return 1+x*(1+x/2*(1+x/3*(1+x/4*(1+x/5*(1+x/6*(1+x/7*(1+x/8*(1+x/9*(1+x/10)))))))));
```

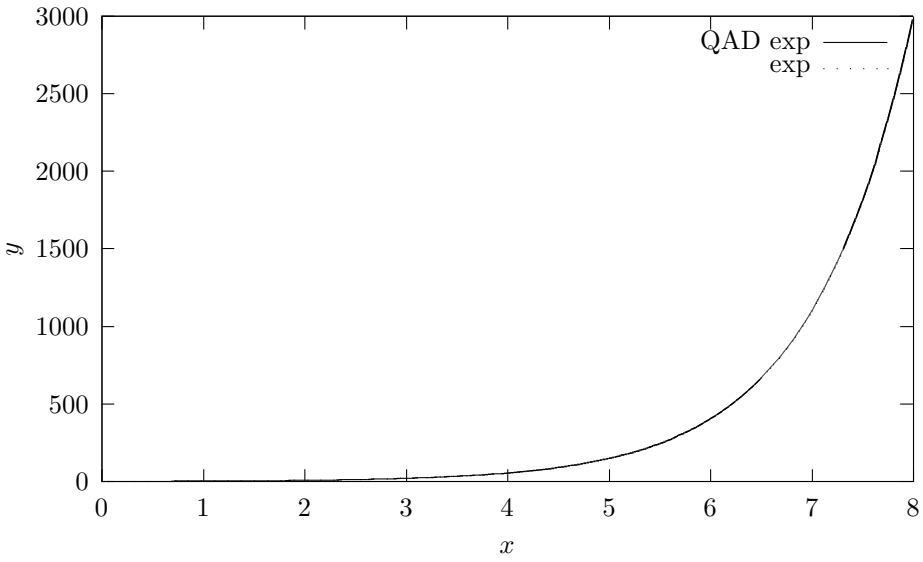

Figure 1: exponential function plot