**** The first page is just definitions. There are useful plots on the next three pages ****

When needing to integrate the Maxwell speed distribution, you should always first change variables so that you are working with a dimensionless function of a dimensionless variable. The function you will get will be

$$x^2 e^{-x^2}$$

It is useful to scale this function so that the total area under it is 1. Define:

$$f(x) = \frac{4}{\sqrt{\pi}} x^2 e^{-x^2}$$

The first of the three plots is that of f as a function of x.

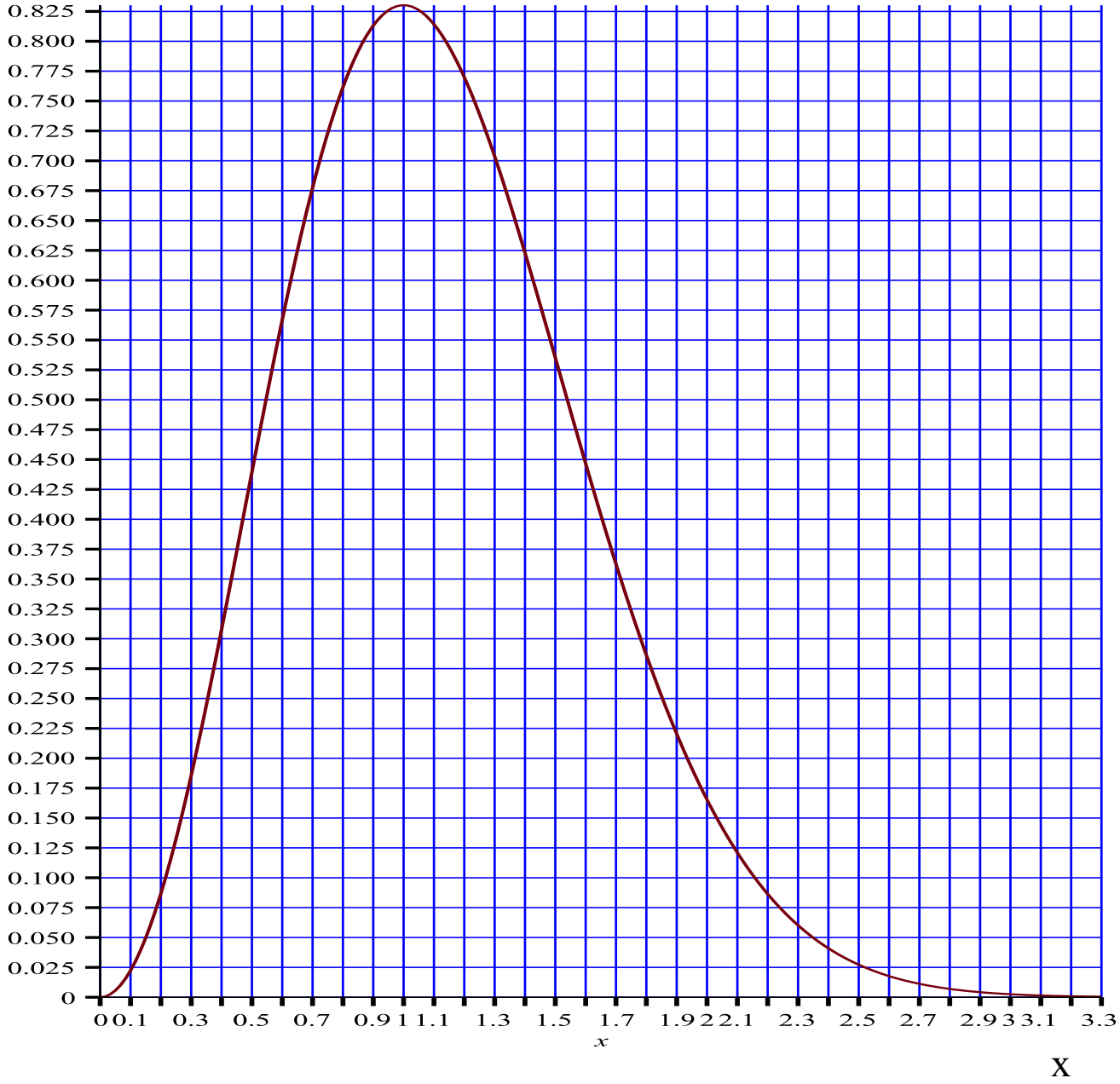
More useful is the corresponding cumulative distribution, defined by

$$F(x) = \int_0^x f(y)dy$$

The second of the three plots is F as a function of x.

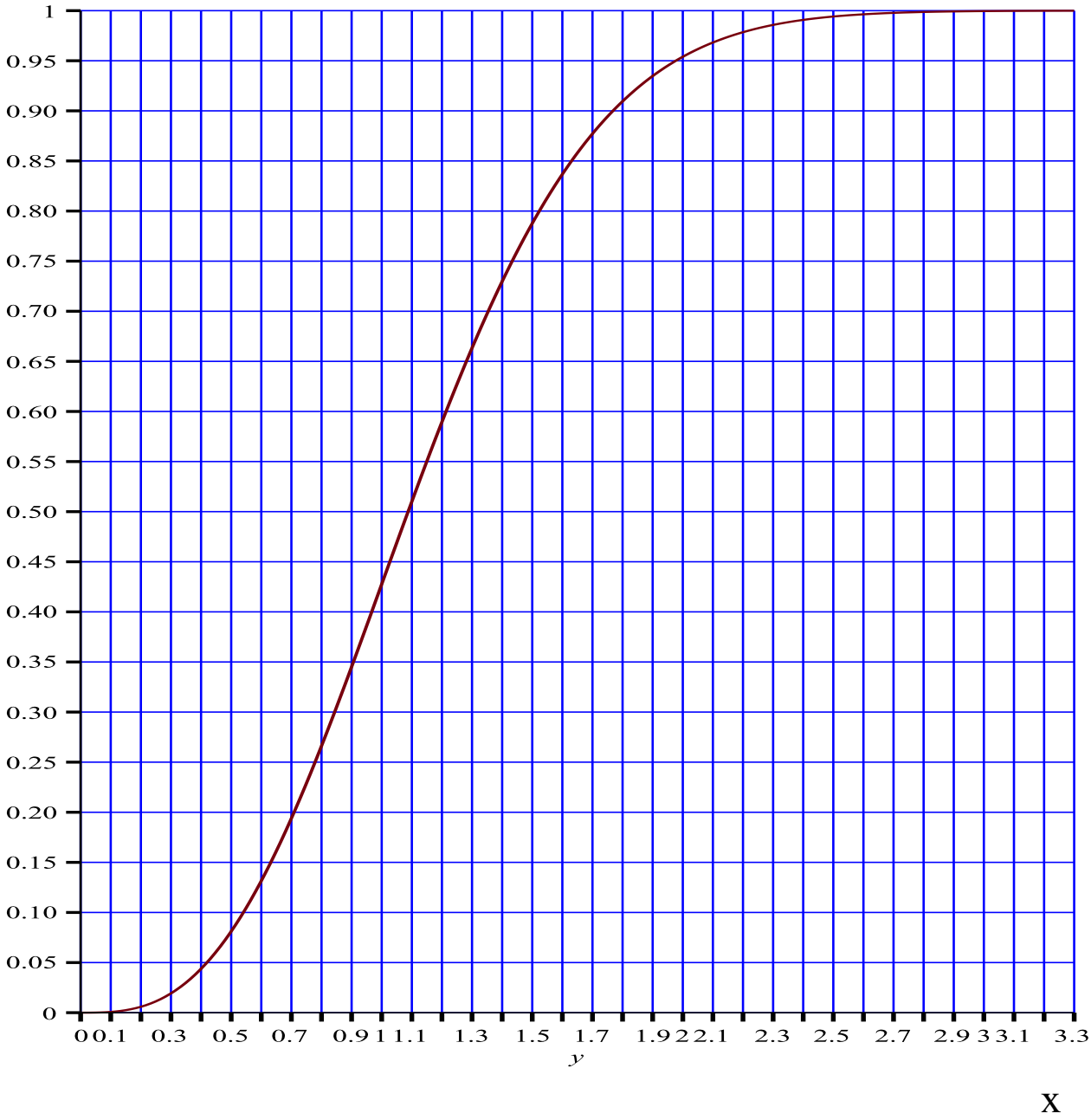
The third plot shows $\ln(1 - F)$ as a function of x, which is useful for values of x large enough that $F(x)$ is basicaly 1.

f(x)


0.825
0.800
0.775
0.750
0.725
0.700
0.675
0.650
0.625
0.600
0.575
0.550
0.525
0.500
0.475
0.450
0.425
0.400
0.375
0.350
0.325
0.300
0.275
0.250
0.225
0.200
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0
0 0.1 0.3 0.5 0.7 0.9 1 1.1 1.3 1.5 1.7 1.9 2 2.1 2.3 2.5 2.7 2.9 3 3.1 3.3
x

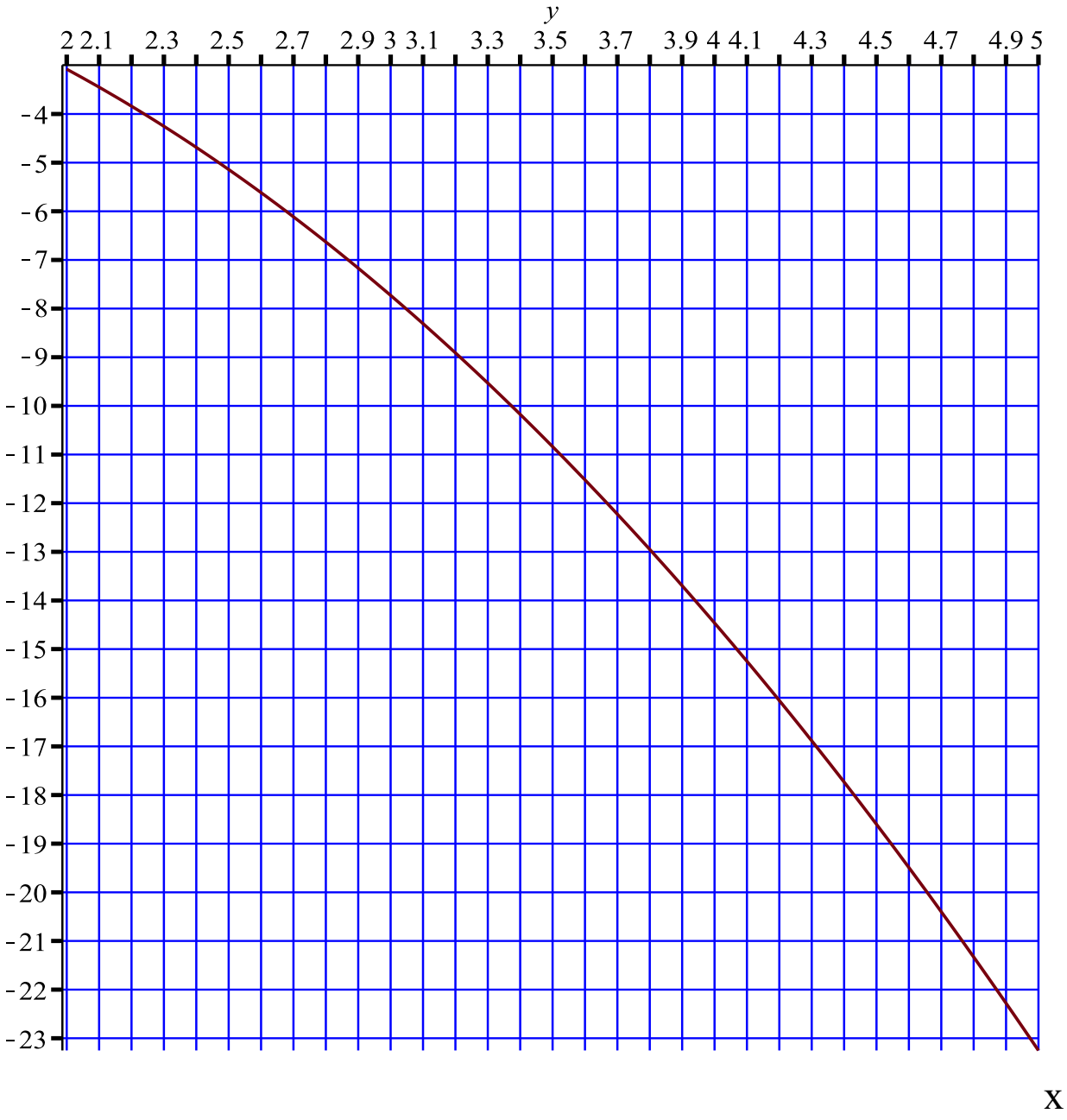
X

F(x)


1
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0
0 0.1 0.3 0.5 0.7 0.9 1 1.1 1.3 1.5 1.7 1.9 2 2.1 2.3 2.5 2.7 2.9 3 3.1 3.3
y

X

ln(1-F(x))


y
2 2.1 2.3 2.5 2.7 2.9 3 3.1 3.3 3.5 3.7 3.9 4 4.1 4.3 4.5 4.7 4.9 5
-4 -5 -6 -7 -8 -9 -10 -11 -12 -13 -14 -15 -16 -17 -18 -19 -20 -21 -22 -23
x