

## Intermediate Laboratory: Homework 4

Due: 16 February 2024

1 Taylor, *Error Analysis*, 2<sup>nd</sup> ed., 5.2, page 154.

2 Taylor, *Error Analysis*, 2<sup>nd</sup> ed., 5.6, page 155.

3 Taylor, *Error Analysis*, 2<sup>nd</sup> ed., 5.8, page 155.

### 4 Normal distribution

A normal distribution has the form

$$G(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-(x-x_0)^2/2\sigma^2}$$

Plot this in the range  $-10 \leq x \leq 10$  on the same set of axes for:

a)  $x_0 = 0$  and  $\sigma = 1$ .

b)  $x_0 = 2$  and  $\sigma = 1$ .

c)  $x_0 = 0$  and  $\sigma = 5$ .

d)  $x_0 = 2$  and  $\sigma = 5$ .

e) How is the shape of the graph affected by increasing  $x_0$  while keeping  $\sigma$  constant?

f) How is the shape of the graph affected by increasing  $\sigma$  while keeping  $x_0$  constant?

5 Taylor, *Error Analysis*, 2<sup>nd</sup> ed., 5.12, page 156.

6 Taylor, *Error Analysis*, 2<sup>nd</sup> ed., 5.32, page 160.

7 Taylor, *Error Analysis*, 2<sup>nd</sup> ed., 5.36, page 161.