Example HOMEWORK for PHY 711
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Problem Set 0

The purpose of this problem set is to become familiar with the use of Maple, Mathematica, or Wolfram Alpha as a tool for analyzing mathematically complex problems. Choose one of the tools to visualize and solve the following problems. (In this case we are using Maple)

1. Numerically find the values of x which satisfy the following equation.

```
> x^3-x^2=7
```

$$x^3 - x^2 = 7 \quad \textbf{(1)}$$

Use graphics to help visualize the problem.

2. Find the following integral as a function of x.

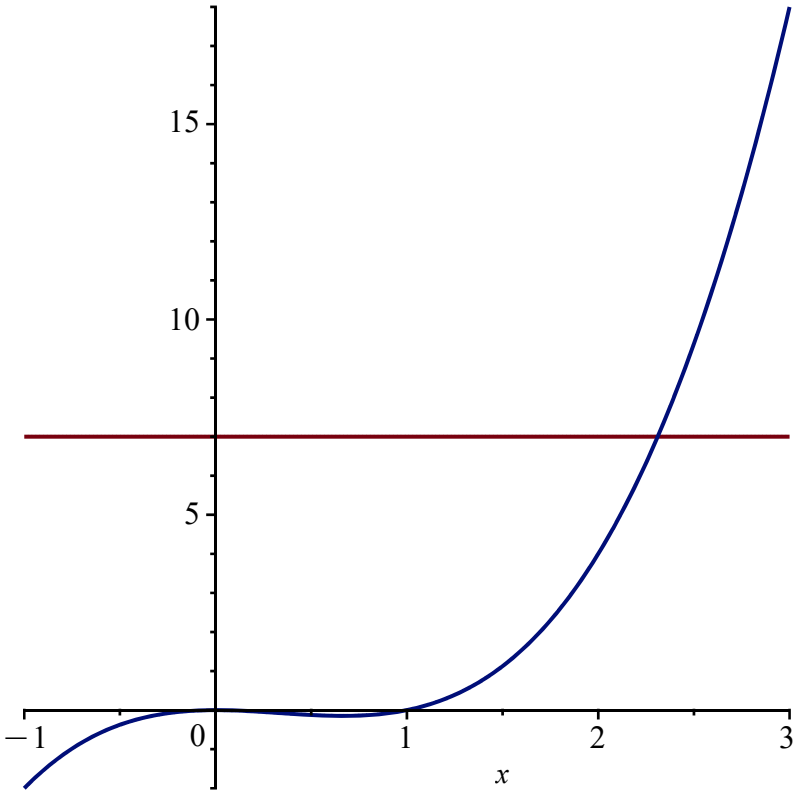
```
> g := x->int(exp(-s^2), s=0..x)
```

$$g := x \mapsto \int_0^x e^{-s^2}\, ds \quad \textbf{(2)}$$

Use graphics to help you visualize the integrand and the intregral.

1.

```
> plot({x^3-x^2, 7}, x=-1..3);
```



```
> fsolve(x^3 - x^2 = 7, x = 2.5)
```

$$2.310852163 \tag{3}$$

Here we see that there is one solution for the equation which is x=2.310852163

2. We can use Maple to evaluate the integral

```
> g := x→int(exp(-s^2), s = 0..x)
```

$$g := x \mapsto \int_0^x e^{-s^2}\, ds \tag{4}$$

```
> g(x)
```

$$\frac{\sqrt{\pi}\ \mathrm{erf}(x)}{2} \tag{5}$$

```
plot({exp(-u^2), g(u)}, u = 0..3)
```