Analytical Methods with Wolfram Language

Based on the presentation at https://www.youtube.com/watch?v=JTz4wkD-mxU

Set up an aid to book to do analytical work on the side.

In[•]:=
```
Integrate[x^2, {x, 0, x}]
```

Out[•]=

$$\frac{x^3}{3}$$

AiryAI Simplification

This is why you key in as much as you can in fractions to find all sorts of interesting simplifications.s

Mathematica enables you to basicallly copy Ramanujan and explore mathematics. Always use fractions on Mathematica to automatically find closed forms.

In[•]:=
```
PDF[StableDistribution[3 / 2, 1, 0, 1], x]
```

Out[•]=

$$-\frac{2^{1/3}\, e^{\frac{x^3}{27}} \left(3^{1/3}\, x\, \text{AiryAi}\left[\frac{x^2}{3\times 2^{2/3}\times 3^{1/3}}\right] + 3\times 2^{1/3}\, \text{AiryAiPrime}\left[\frac{x^2}{3\times 2^{2/3}\times 3^{1/3}}\right]\right)}{3\times 3^{2/3}}$$

In[•]:=
```
FullSimplify[PDF[StableDistribution[3 / 2, 1, 0, 1], x]]
```

Out[•]=

$$e^{\frac{x^3}{27}} \left(3^{1/3}\, x\, \text{AiryAi}\left[x^2\, \text{Root}\left[-1 + 324\, \#1^3\, \&,\, 1,\, 0\right]\right] + 3\times 2^{1/3}\, \text{AiryAiPrime}\left[x^2\, \text{Root}\left[-1 + 324\, \#1^3\, \&,\, 1,\, 0\right]\right]\right) \text{Root}\left[2 + 243\, \#1^3\, \&,\, 1,\, 0\right]$$