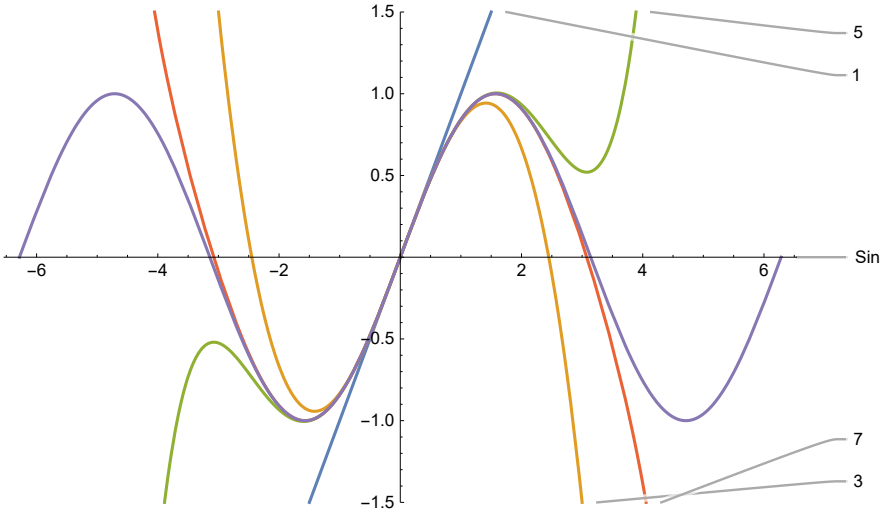
In[•]:=
```
a_k_ := { (-1)^((k-1)/2)/k!   OddQ[k]
        {        0            EvenQ[k] ;
Plot[Evaluate@Append[
   Table[Labeled[Sum[a_k x^k, {k, 0, n}], n], {n, {1, 3, 5, 7}}],
   Labeled[Sin[x], Sin]
  ], {x, -2 π, 2 π}, PlotRange → {-1.5, 1.5}]
```

Out[•]=



In[•]:=
```
Column@Table[k → N[a_k 157^k], {k, {0, 3, 9, 13, 29, 35, 157, 223, 457}}]
```

Out[•]=
$0 \to 0.$
$3 \to -644\,982.$
$9 \to 1.59711 \times 10^{14}$
$13 \to 5.65477 \times 10^{18}$
$29 \to 5.42689 \times 10^{32}$
$35 \to -6.95433 \times 10^{36}$
$157 \to 4.86366 \times 10^{66}$
$223 \to -1.94045 \times 10^{61}$
$457 \to 4.87404 \times 10^{-16}$

In[•]:=
```
{N[Sum[a_k 157^k, {k, 0, 457}]], Sum[N[a_k 157^k], {k, 0, 457}]}
```

Out[•]= $\{-0.0795485,\ 5.10624 \times 10^{50}\}$

In[•]:=
```
N@Sin[157]
```

Out[•]= −0.0795485

In[•]:=
```
w = N@WolframAlpha["Width of a Hydrogen Atom", "Result"]
```

Out[•]= 50. pm

In[•]:=
```
ϕ[q_] := (For[k = 0, Abs[a_k 157^k] < q / w, ++k]; {q, q / w, k})
```

In[•]:=

Out[•]= Interval[{0.00078, 0.00078}] cm

In[•]:= ϕ@Quantity[0.00078 × 0.01, "Meters"]

Out[•]= {7.8 × 10^-6 m, 156 000., 3}

In[•]:=

Out[•]= 553.3 m

In[•]:= ϕ@Quantity[553.3, "Meters"]

Out[•]= {553.3 m, 1.1066 × 10^13, 9}

Diameter of the rings of Saturn:

In[•]:= ϕ@Quantity[280 000 × 1000, "Meters"]

Out[•]= {280 000 000 m, 5.6 × 10^18, 13}

In[•]:=

Out[•]= 100 000 ly (light years)

In[•]:= ϕ[Quantity[100 000 × 365 × 24 × 3600 × 300 000 × 1000, "Meters"]]

Out[•]= {946 080 000 000 000 000 000 m, 1.89216 × 10^31, 29}

In[•]:=

Out[•]= 93 billion ly (light years)
(It is not however known if the size of the *entire* universe is finite or infinite.)

In[•]:= ϕ[Quantity[93 × 10^9 × 365 × 24 × 3600 × 300 000 × 1000, "Meters"]]

Out[•]= {879 854 400 000 000 000 000 000 000 m, 1.75971 × 10^37, 37}