Fourier Transform of sine - Gaussian

Define Functions

In[83]:=
```
sineGaussian[t_] := A e^(-Γ t^2) Sin[2 π f_c t]
```

In[84]:=
```
FT[f_] := Abs[1/Sqrt[T] ∫_0^T (sineGaussian[t] e^(2 π f i t)) dt]
```

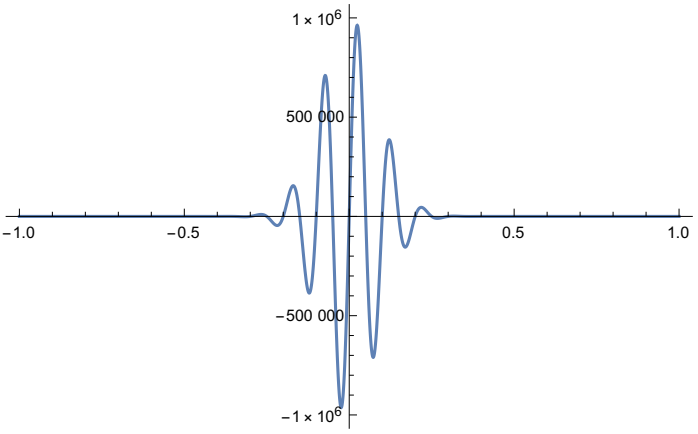
Define constants

In[111]:=
```
T = 1; f_c = 1*^1; Q = 1; Γ = 2 π f_c / Q^2; A = 1*^6;
```

Plot time-series

In[112]:=
```
Plot[sineGaussian[t], {t, -1, 1}, PlotRange → All]
```

Out[112]=



~~If I copy the output of typing FT[f] and turn it into a new function, and plot the new function, it is significantly faster than just plotting FT[g] - this takes much longer.~~

In[44]:=

Plot Fourier Transform

```
LogLogPlot[Evaluate[FT[f]], {f, 0.01, 10^5}, PlotRange → Full]
```

Out[113]=