

## Fourier Transform of sine - Gaussian

Define Functions

```
In[63]:= sineGaussian[t_] := A  $e^{-\Gamma t^2}$  Sin[2  $\pi$  fc t]
```

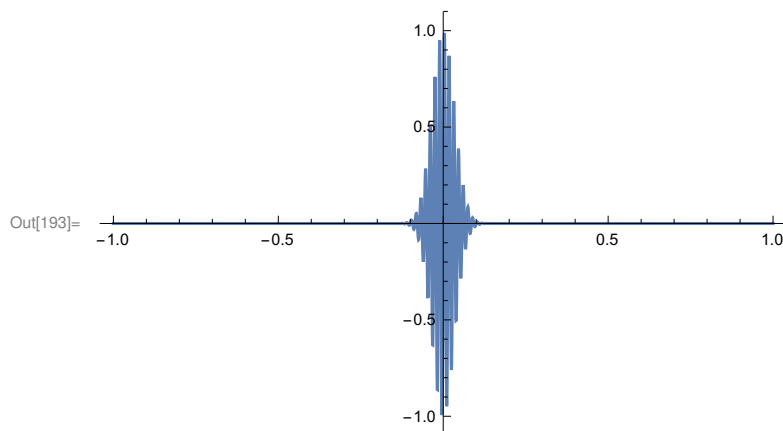
```
In[170]:= FT[f_] := Abs[ $\frac{\sqrt{2}}{\sqrt{T}} \int_{-T}^T (\text{sineGaussian}[t] e^{2 \pi f i t}) dt$ ]
```

Define constants

```
In[192]:= T = 1; fc = 7*^1; Q = 1;  $\Gamma = \frac{2 \pi f_c}{Q}$ ; A = 1;
```

Plot time-series

```
In[193]:= Plot[sineGaussian[t], {t, -T, T}, PlotRange -> All]
```



~~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[ ] :=
```

Plot Fourier Transform

```
In[194]:= LogLogPlot[Evaluate[FT[f]], {f, 1, 1000}, PlotRange -> Full]
```

