# Introduction to Mathematica

#CA1

#Q6

Signals & Systems

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In[]:=
```
X3[t_] := UnitStep[t - 3] / t^(1/4)
EX3[t_] = Integral_-1000000^1000000 (Abs[X3[t]]^2) dt
EX33[t_] = Integral_-1000000000000^1000000000000 (Abs[X3[t]]^2) dt
PX3[t_] = Limit[(1/(2*T)) * Integral_-T^T (Abs[X3[t]]^2) dt, T -> Infinity]
```

Out[]=
$$-2\left(-1000+\sqrt{3}\right)$$

Out[]=
$$-2\left(-1\,000\,000+\sqrt{3}\right)$$

Out[]=
```
Undefined
```

In[]:=
```
X4[t_] := t * Exp[-2 * t] * UnitStep[t]
EX4[t_] = Integral_-Infinity^Infinity (Abs[X4[t]]^2) dt
PX4[t_] = Limit[(1/(2*T)) * Integral_-T^T (Abs[X4[t]]^2) dt, T -> Infinity]
```

Out[]=
$$\frac{1}{32}$$

Out[]=
```
0
```

In[]:=
```
X5[t_] := Exp[-2 * t] * Cos[0.5 * Pi * t] * UnitStep[t]
EX5[t_] = Integral_-Infinity^Infinity (Abs[X5[t]]^2) dt
PX5[t_] = Limit[(1/(2*T)) * Integral_-T^T (Abs[X5[t]]^2) dt, T -> Infinity]
```

Out[]=
```
0.202311
```

Out[]=
```
0.
```