Introduction to Mathematica

#CA1

#Q3

Signals & Systems

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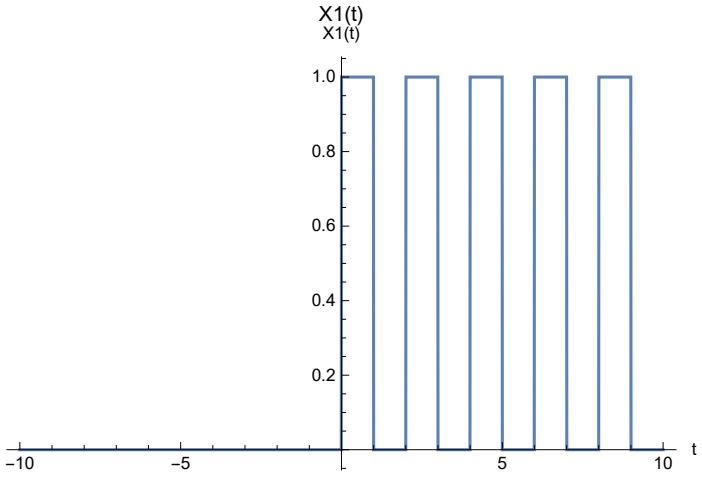
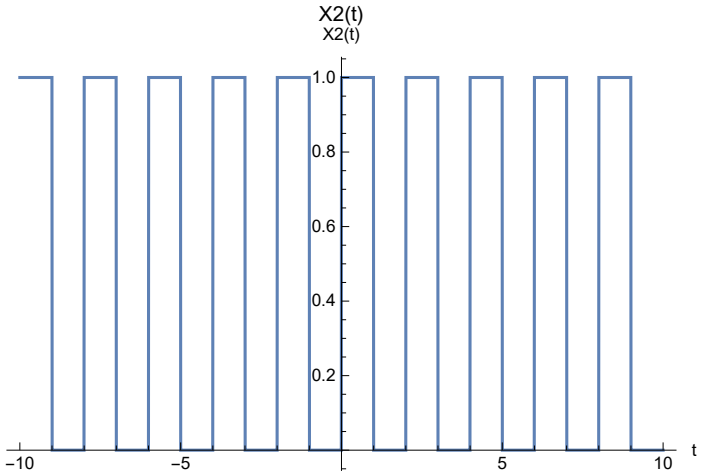
In[•]:=
```
X1[t_] := Sum[(UnitStep[t - 2 n]) * (UnitStep[1 + 2 * n - t]), {n, 0, Infinity}]
Plot[X1[t], {t, -10, 10}, PlotLabel → "X1(t)", AxesLabel → {"t", "X1(t)"}]
```

Out[•]=



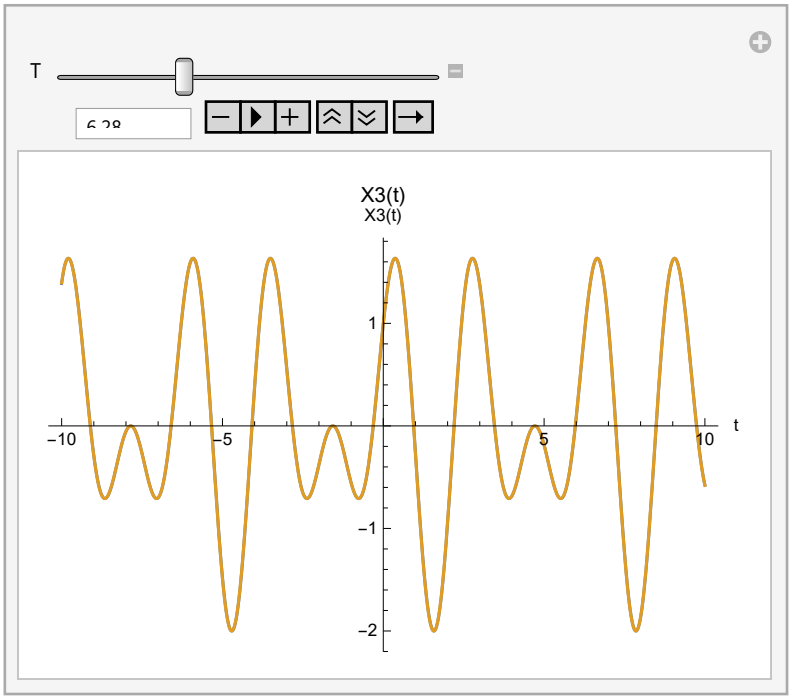
In[•]:=
```
X2[t_] := Sum[(UnitStep[t - 2 n]) * (UnitStep[1 + 2 * n - t]), {n, -Infinity, Infinity}]
Plot[X2[t], {t, -10, 10}, PlotLabel → "X2(t)", AxesLabel → {"t", "X2(t)"}]
```

Out[•]=



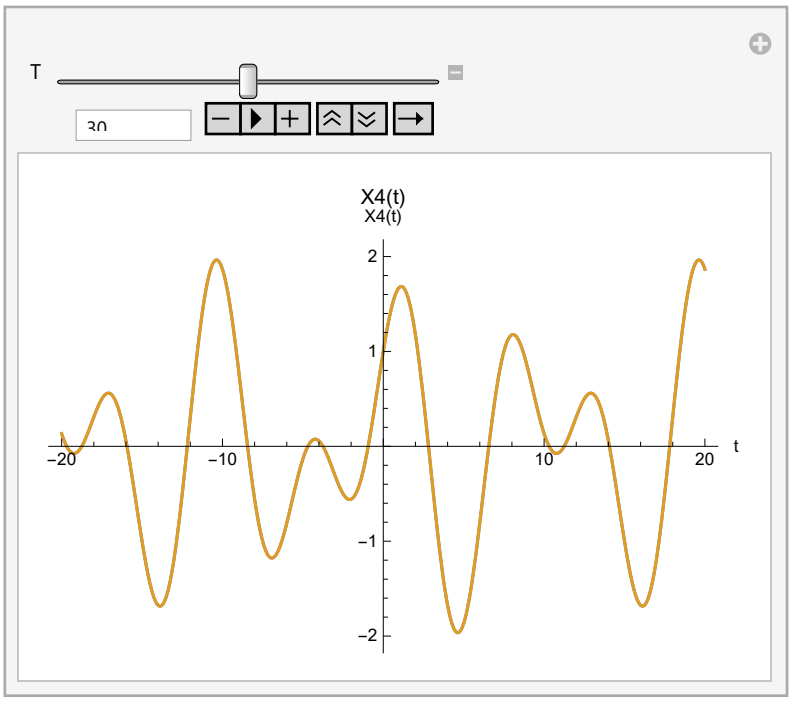
In[1]:=
```
X3[t_] := Cos[2 * t] + Sin[3 * t]
Manipulate[Plot[{X3[t + T], X3[t]}, {t, -10, 10},
  PlotLabel → "X3(t)", AxesLabel → {"t", "X3(t)"}], {T, 0, 20}]
```

Out[2]=



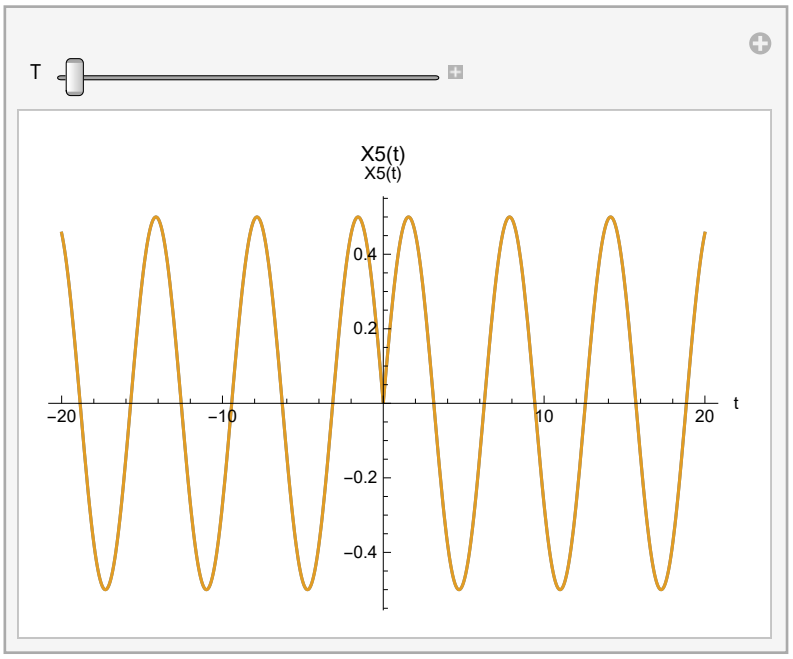
In[3]:=
```
X4[t_] := Cos[(Pi * t) / 5] + Sin[(Pi * t) / 3]
Manipulate[Plot[{X4[t + T], X4[t]}, {t, -20, 20},
  PlotLabel → "X4(t)", AxesLabel → {"t", "X4(t)"}], {T, 0, 60}]
```

Out[4]=



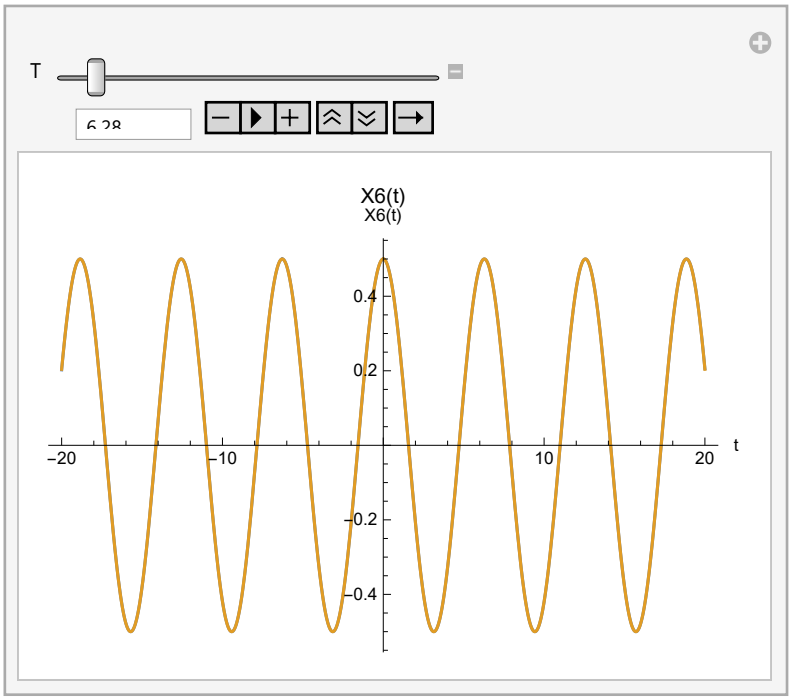
In[5]:=
```
X5[t_] := Sin[t] * UnitStep[t]
Manipulate[Plot[{(X5[t + T] + X5[-(t + T)]) / 2, (X5[t] + X5[-t]) / 2},
  {t, -20, 20}, PlotLabel → "X5(t)", AxesLabel → {"t", "X5(t)"}], {T, 0, 100}]
```

Out[6]=



In[7]:=
```
X6[t_] := Cos[t] * UnitStep[t]
Manipulate[Plot[{(X6[t + T] + X6[-(t + T)]) / 2, (X6[t] + X6[-t]) / 2},
  {t, -20, 20}, PlotLabel → "X6(t)", AxesLabel → {"t", "X6(t)"}], {T, 0, 100}]
```

Out[8]=



In[9]:=
```
X7[t_] := Sum[(Ramp[(t - 0.3 * k) + 1] - 2 Ramp[t - 0.3 * k] + Ramp[(t - 0.3 * k) - 1]), {k, -100, 100}]
Plot[ X7[t], {t, -1, 1}, PlotLabel → "X7(t)", AxesLabel → {"t", "X7(t)"}]
```

Out[10]=