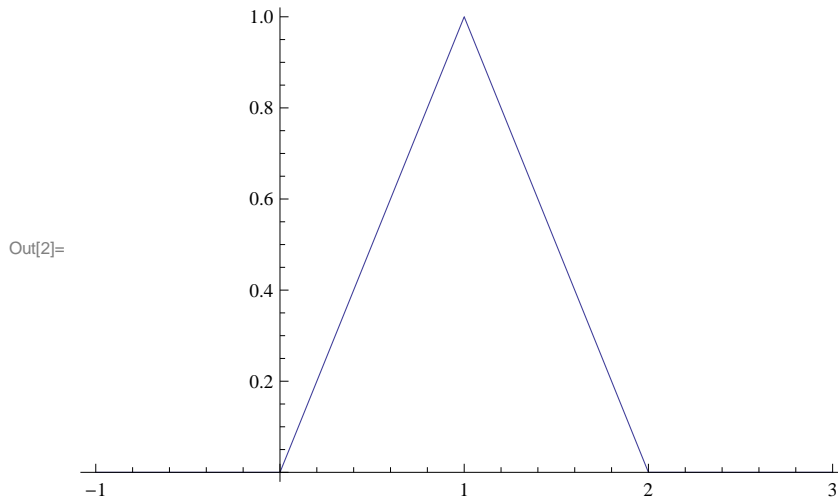


■ Acceleration

```
In[1]:= accel = Piecewise[{{ $\frac{a0}{t0} \#$ ,  $0 < \# < t0$ }, { $2 a0 - \frac{a0}{t0} \#$ ,  $t0 < \# < 2 t0$ }}, 0] &;
```

```
In[2]:= Plot[accel[x] /. {a0 -> 1, t0 -> 1}, {x, -1, 3}]
```



■ Velocity

```
In[23]:= v0 = Assuming[0 > t, Integrate[accel[tt], {tt, 0, t}]]  
v1 = Assuming[0 < t < t0, Integrate[accel[tt], {tt, 0, t}]]  
v2 = Assuming[t0 < t < 2 t0, Integrate[accel[tt], {tt, 0, t}]]  
v3 = Assuming[{t > 2 t0, t0 > 0}, Integrate[accel[tt], {tt, 0, t}]]
```

Out[23]= 0

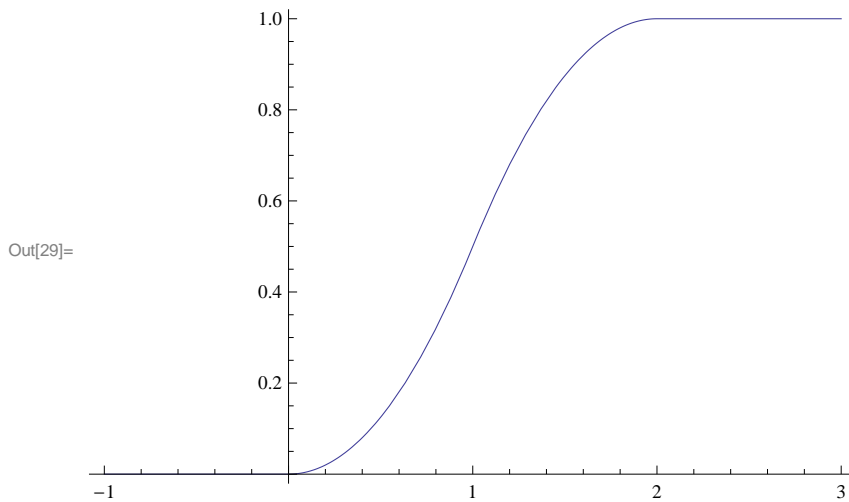
Out[24]= $\frac{a0 t^2}{2 t0}$

Out[25]= $\frac{-a0 t^2 + 4 a0 t t0 - 2 a0 t0^2}{2 t0}$

Out[26]= $a0 t0$

```
In[27]:= vel[t_] := Piecewise[{{v0, t < 0}, {v1, 0 < t < t0}, {v2, t0 < t < 2 t0}, {v3, 2 t0 < t}}]
```

```
In[29]:= Plot[vel[t] /. {a0 -> 1, t0 -> 1}, {t, -1, 3}]
```



■ Position

```
In[30]:= x0 = Assuming[0 > t, Integrate[vel[tt], {tt, 0, t}]]
          x1 = Assuming[0 < t < t0, Integrate[vel[tt], {tt, 0, t}]]
          x2 = Assuming[t0 < t < 2 t0, Integrate[vel[tt], {tt, 0, t}]]
          x3 = Assuming[{t > 2 t0, t0 > 0}, Integrate[vel[tt], {tt, 0, t}]]
```

Out[30]= 0

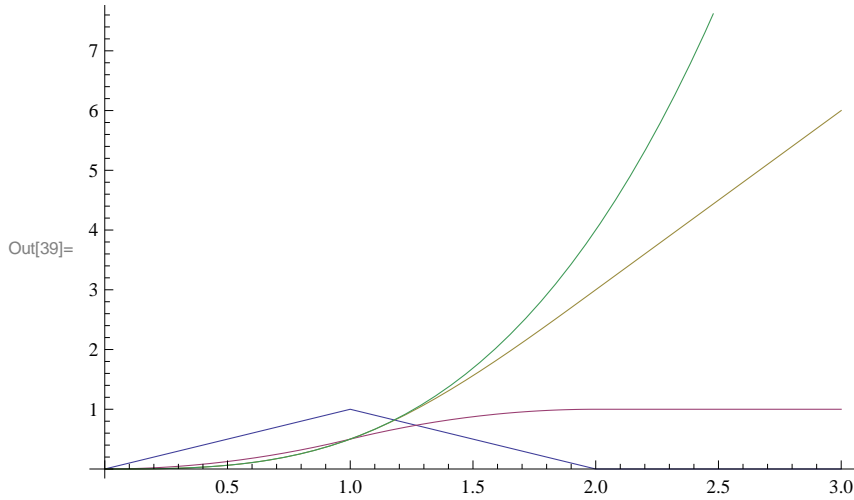
$$\text{Out[31]} = \frac{a_0 t^3}{2 t_0}$$

$$\text{Out[32]} = \frac{-a_0 t^3 + 6 a_0 t^2 t_0 - 6 a_0 t t_0^2 + 2 a_0 t_0^3}{2 t_0}$$

$$\text{Out[33]} = 3 (a_0 t t_0 - a_0 t_0^2)$$

```
In[34]:= pos[t_] := Piecewise[{{x0, t < 0}, {x1, 0 < t < t0}, {x2, t0 < t < 2 t0}, {x3, 2 t0 < t}}]
```

```
In[39]:= Plot[{accel[t] /. {a0 -> 1, t0 -> 1}, vel[t] /. {a0 -> 1, t0 -> 1},
  pos[t] /. {a0 -> 1, t0 -> 1},  $\frac{a_0 t^3}{2 t_0}$  /. {a0 -> 1, t0 -> 1}], {t, 0, 3}]
```



```
In[38]:= Plot[{accel[t] /. {a0 -> 1, t0 -> 1}, vel[t] /. {a0 -> 1, t0 -> 1},
  pos[t] /. {a0 -> 1, t0 -> 1},  $\frac{a_0 t^3}{2 t_0}$  /. {a0 -> 1, t0 -> 1}], {t, 0, 2}]
```

