

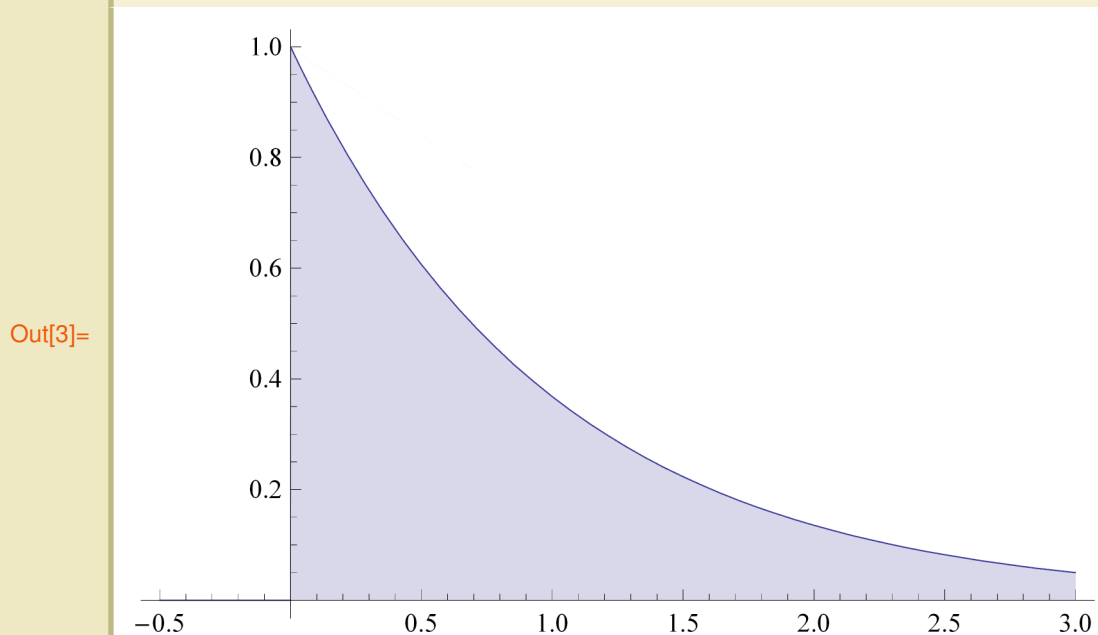
Naloga 1a:

Naloga:

Izračunaj izhod LSS sistema s prevajalno funkcijo $h(t)$ in vhodnim signalom $u(t)$:

▫ Prevajalna funkcija LSS:

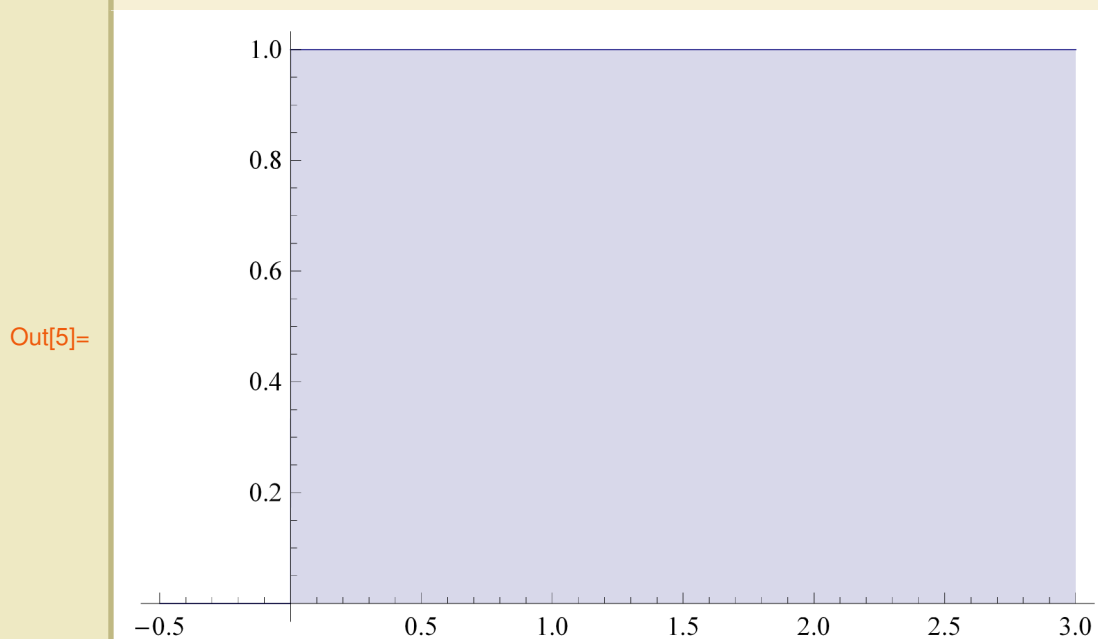
```
In[3]:= Plot[h[t], {t, -0.5, 3.0}, PlotRange -> All, Filling -> Axis]
```



```
In[1]:= h[t_] := { Exp[-t] t >= 0  
               0 True
```

▫ Vhodni signal:

```
In[5]:= Plot[u[t], {t, -0.5, 3.0}, PlotRange -> All, Filling -> Axis]
```



```
In[4]:= u[t_] := { 1 t >= 0  
                0 True
```

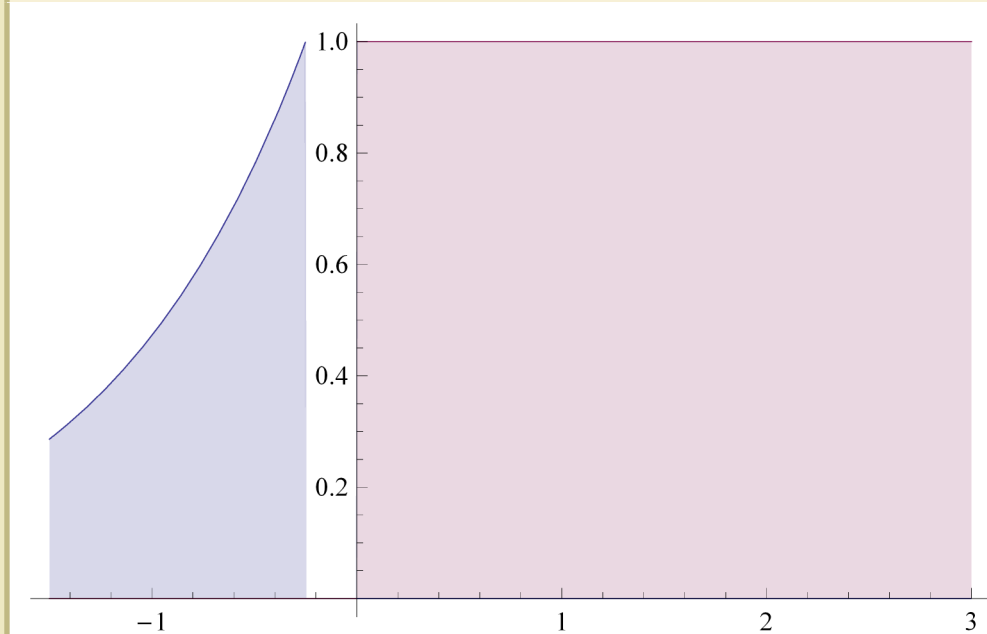
▫ Konvolucija:

$$y(t) = \int_{-\infty}^{\infty} u(\tau) h(t - \tau) d\tau$$

□ Za interval $t < 0$:

In[7]:= $t = -\frac{1}{4}$; Plot[{h[t - τ], u[τ]}, { τ , -1.5, 3.0}, PlotRange -> All, Filling -> Axis]

Out[7]=

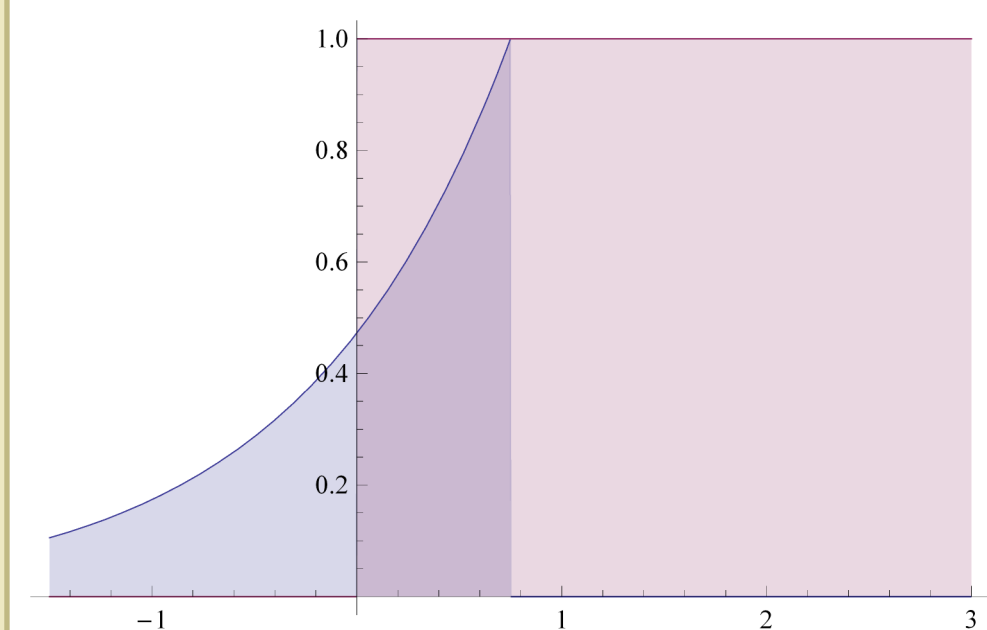


$y = 0$;

□ Za interval $t \geq 0$:

In[8]:= $t = \frac{3}{4}$; Plot[{h[t - τ], u[τ]}, { τ , -1.5, 3.0}, PlotRange -> All, Filling -> Axis]

Out[8]=



$$y = \int_0^t 1 * (\text{Exp}[-(t - \tau)]) d\tau$$

Out[10]=

$$1 - e^{-t}$$

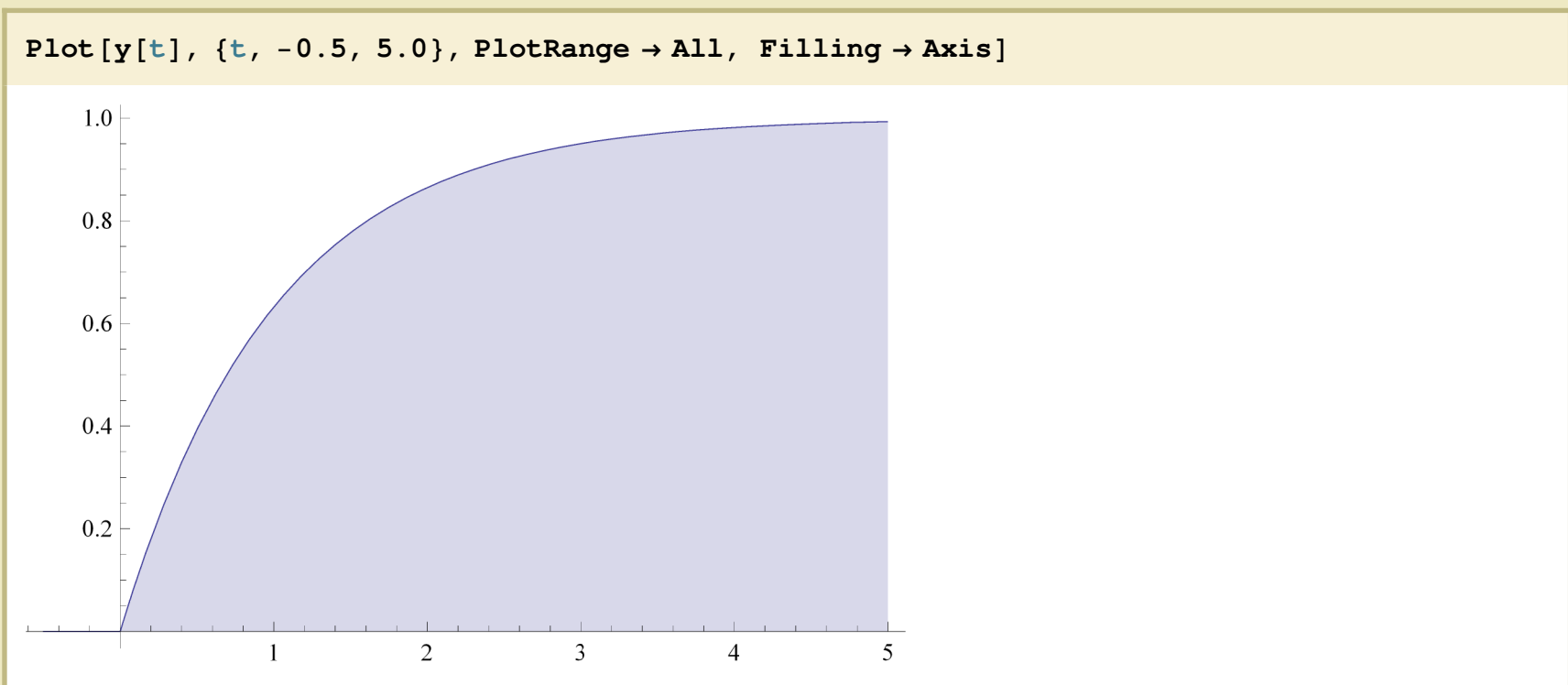
□ Skica izhodnega signala $y(t)$

In[13]:=

$$y[t_] := \begin{cases} 1 - e^{-t} & t \geq 0 \\ 0 & \text{True} \end{cases}$$

```
In[15]:= Plot[y[t], {t, -0.5, 5.0}, PlotRange -> All, Filling -> Axis]
```

```
Out[15]=
```



Naloga 1b:

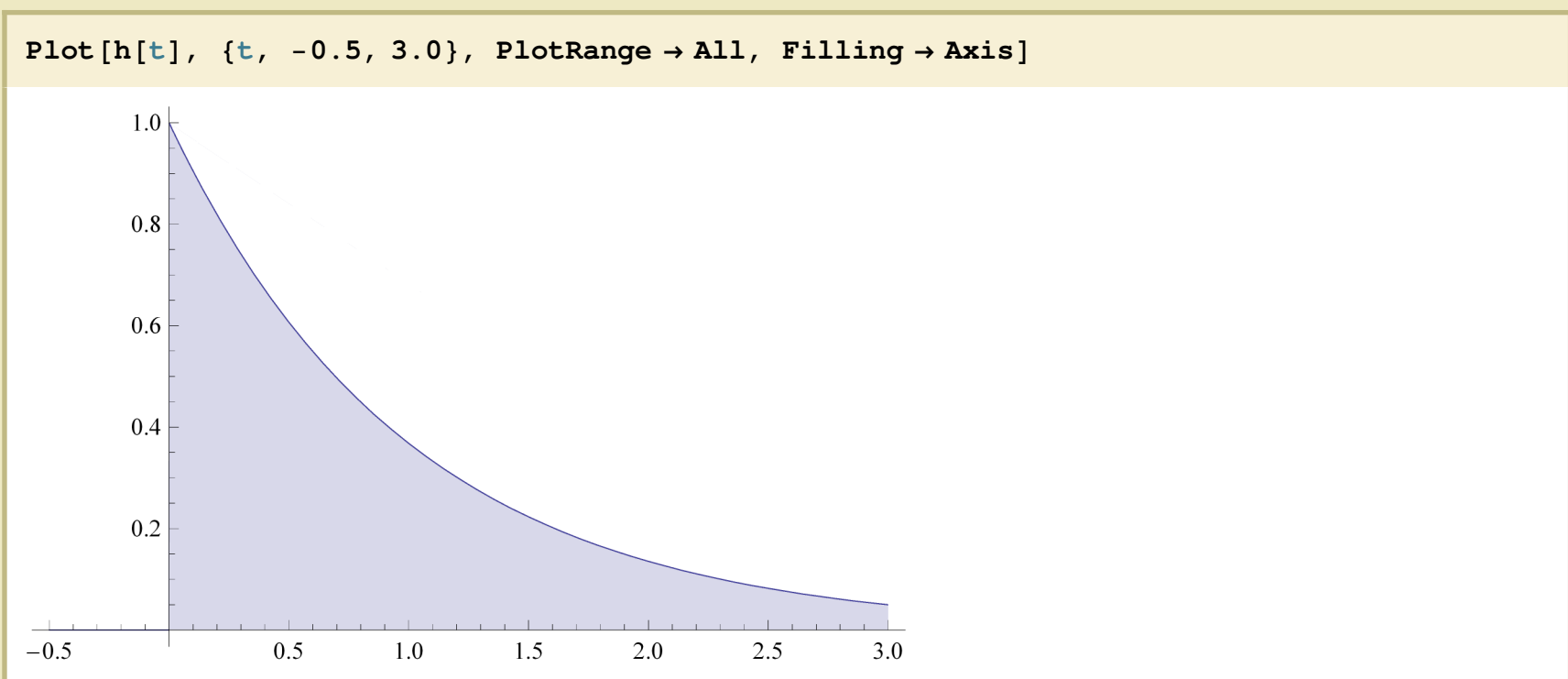
Naloga:

Izračunaj izhod LSS sistema s prevajalno funkcijo $h(t)$ in vhodnim signalom $u(t)$:

▫ Prevajalna funkcija LSS:

```
In[3]:= Plot[h[t], {t, -0.5, 3.0}, PlotRange -> All, Filling -> Axis]
```

```
Out[3]=
```

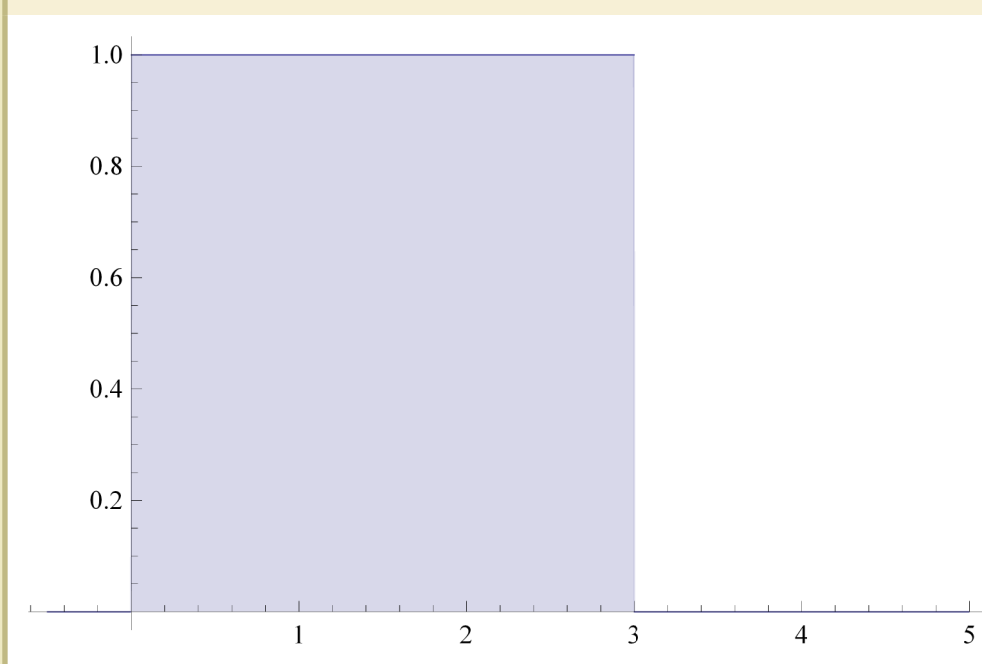


```
In[1]:= h[t_] := { Exp[-t] t >= 0  
                 0      True
```

▫ Vhodni signal:

In[19]:= `Plot[u[t], {t, -0.5, 5.0}, PlotRange -> All, Filling -> Axis]`

Out[19]=



In[18]:= `u[t_] := { 1 0 ≤ t ≤ 3
0 True`

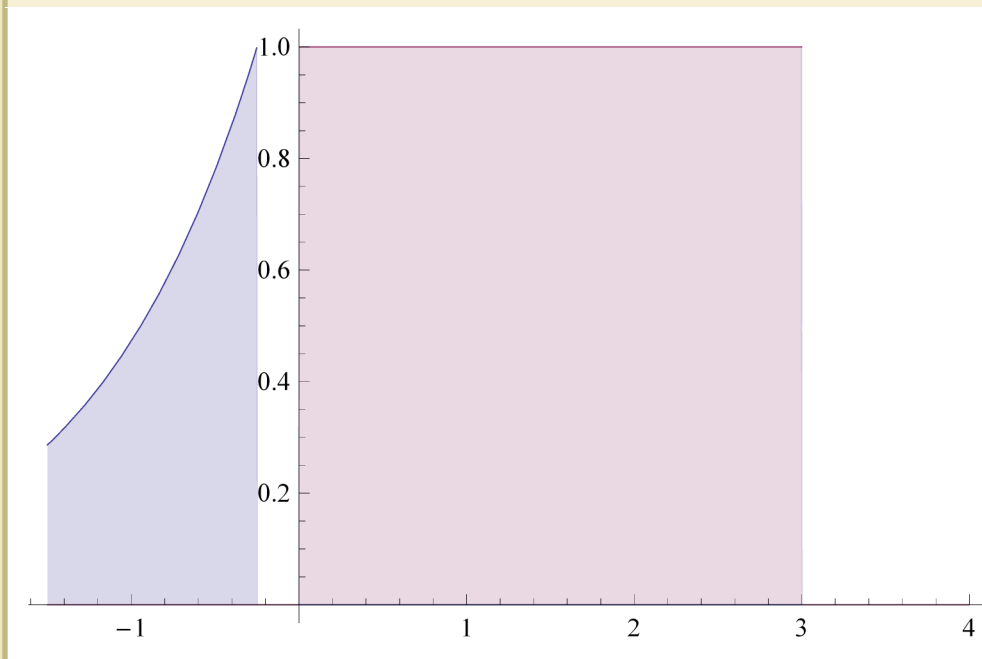
▫ Konvolucija:

$$y(t) = \int_{-\infty}^{\infty} u(\tau) h(t - \tau) d\tau$$

▫ Za interval $t < 0$:

In[20]:= `t = -1/4; Plot[{h[t - τ], u[τ]}, {τ, -1.5, 4.0}, PlotRange -> All, Filling -> Axis]`

Out[20]=

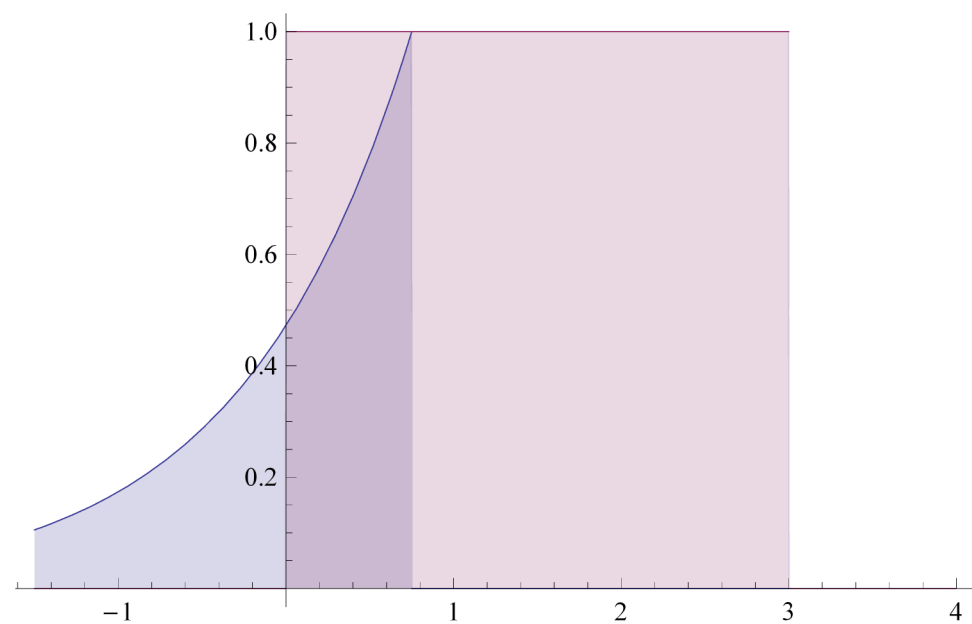


`y = 0;`

▫ Za interval $0 \leq t \leq 3$:

In[21]:= `t = 3/4; Plot[{h[t - τ], u[τ]}, {τ, -1.5, 4.0}, PlotRange -> All, Filling -> Axis]`

Out[21]=



$$y = \int_0^t 1 * (\text{Exp}[-(t - \tau)]) d\tau$$

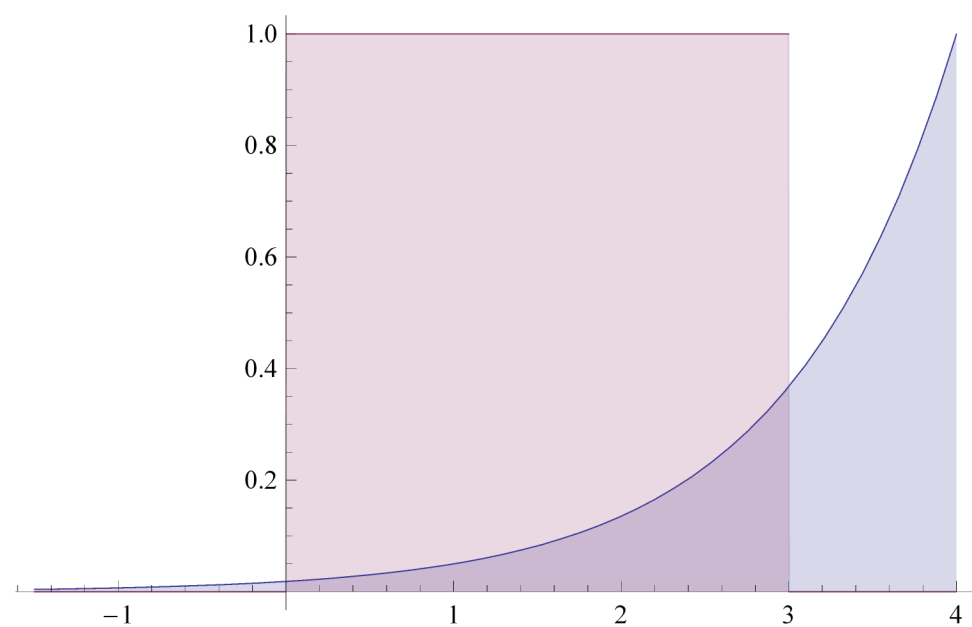
Out[23]=

$$1 - e^{-t}$$

▫ Za interval $t \geq 3$:

In[24]:= `t = 4; Plot[{h[t - τ], u[τ]}, {τ, -1.5, 4.0}, PlotRange -> All, Filling -> Axis]`

Out[24]=



$$y = \int_0^3 1 * (\text{Exp}[-(t - \tau)]) d\tau$$

Out[26]=

$$e^{-t} (-1 + e^3)$$

▫ Skica izhodnega signala $y(t)$

$$y[t_] := \begin{cases} 1 - e^{-t} & 0 \leq t \leq 3 \\ e^{-t} (-1 + e^3) & t \geq 3 \\ 0 & \text{True} \end{cases}$$

In[29]:= `Plot[y[t], {t, -0.5, 5.0}, PlotRange -> All, Filling -> Axis]`

Out[29]=

