```
// инициализация переменной для полинома
s = poly(0, 's')

T0 = 0.79
n = 3
```

ПИ-регулятор

```
K = 1.5
Ti = 2.375
Wtmp = K * ( 1+ 1 / (Ti * s) ) * ( 1 / ( (1+s*T0)^n) )
```

ПИД-регулятор

```
K = 10
Ti = 2
Td =  Ti / 4
Tc = Td / 8
Wtmp = K * ( 1+ 1 / (Ti * s) +  (Td * s) / (1 + Tc * s) ) * ( 1 / ((1+s*T0)^n) )

W = Wtmp / (1 + Wtmp)

Sys = syslin('c', W) // создание системы
```

https://help.scilab.org/docs/6.1.0/ru_RU/syslin.html

```
tau = ?
Sysd  = dscr(Sys, tau)
[Ad, Bd, Cd, Dd] = abcd(Sysd)
```

$\deg b(s)$. Построим соответствующую дискретную систему в нормальной форме первого порядка

$$\begin{cases} v[k+1] = A_d v[k] + B_d u[k], \\ x[k] = C_d v[k]. \end{cases} \tag{5.9}$$

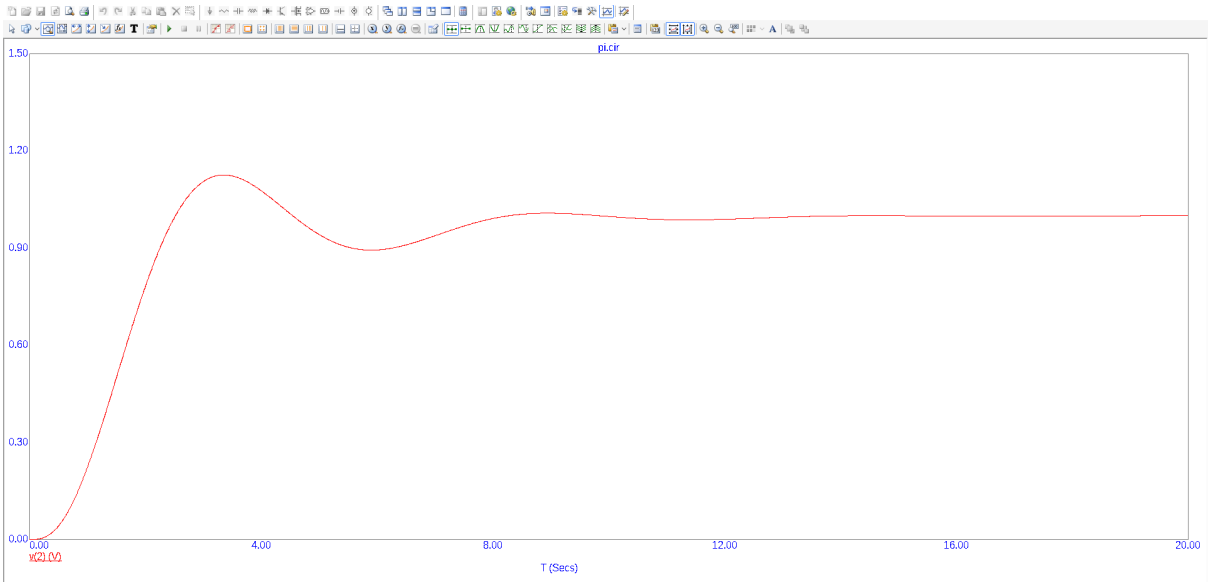
```
hd = 0:tau:20
hd = hd*0
V = Bd*0
for k = 1:length(hd)
        hd(k) = Cd *  V
        V = Ad * V + Bd
end

t = 0:tau:20
plot(t, hd)
```

$$e \doteq \sqrt{\frac{1}{N}\sum_{k=1}^{N}\left[h\left(\left(k-1\right)\tau\right)-h_d[k]\right]^2},$$

h = копируем с файла (из микрокэпа)
e = sqrt((1 / length(hd)) * sum((h - hd') .^ 2))

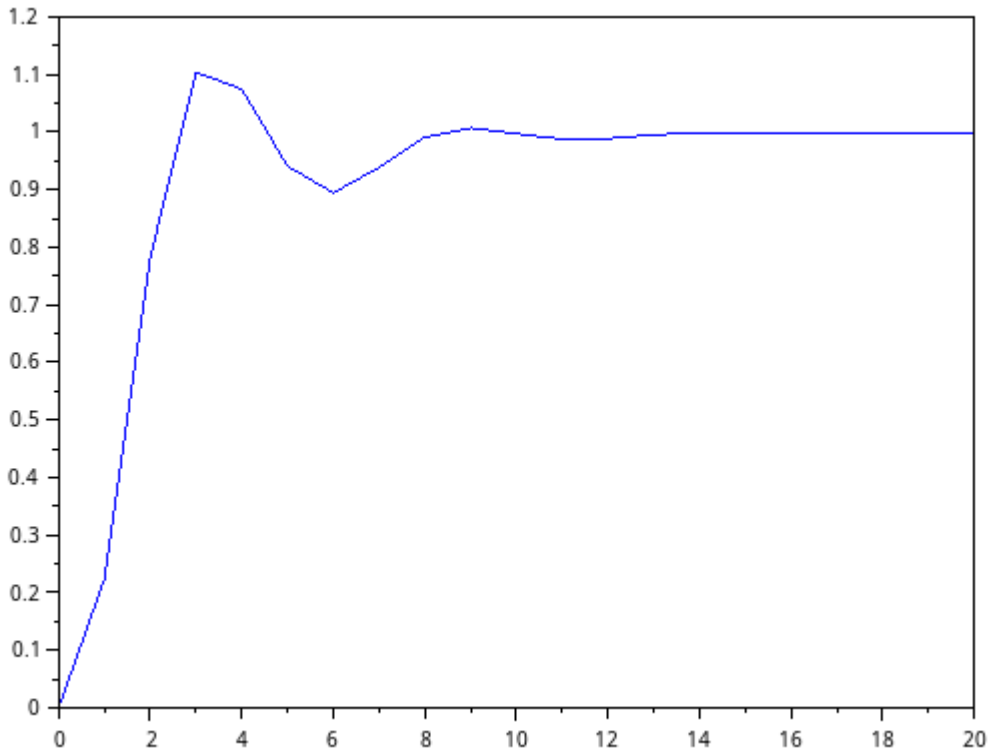
ПИ-регулятор

microcap

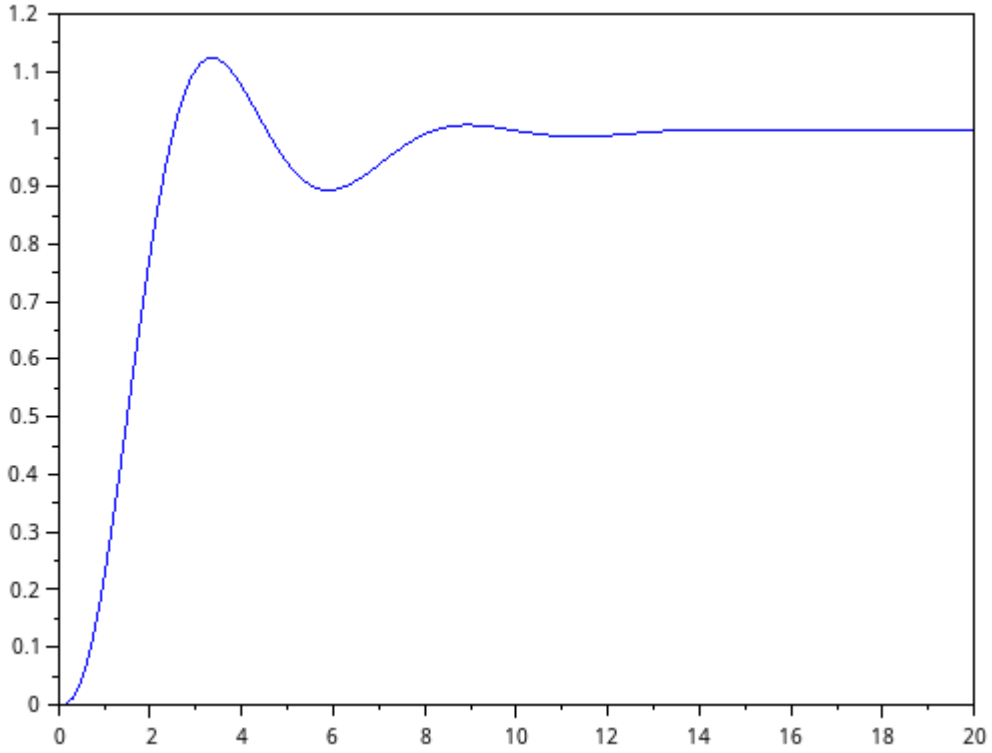


SciLab

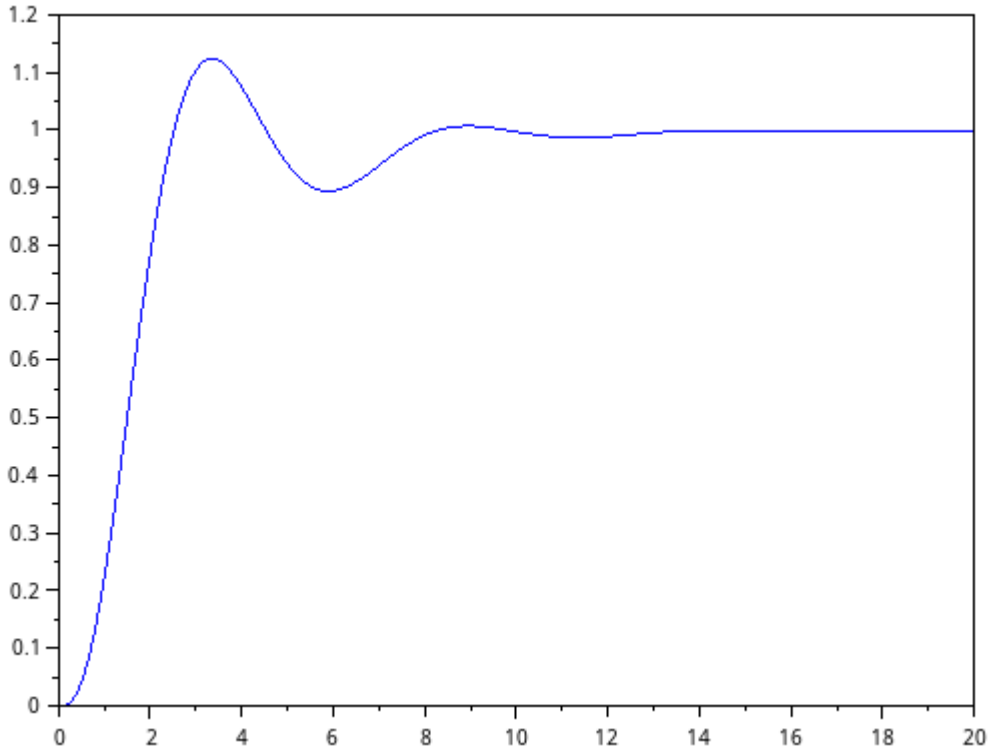
tau = 1
error = 0.0007104



tau = 0.1
error = 0.0006967

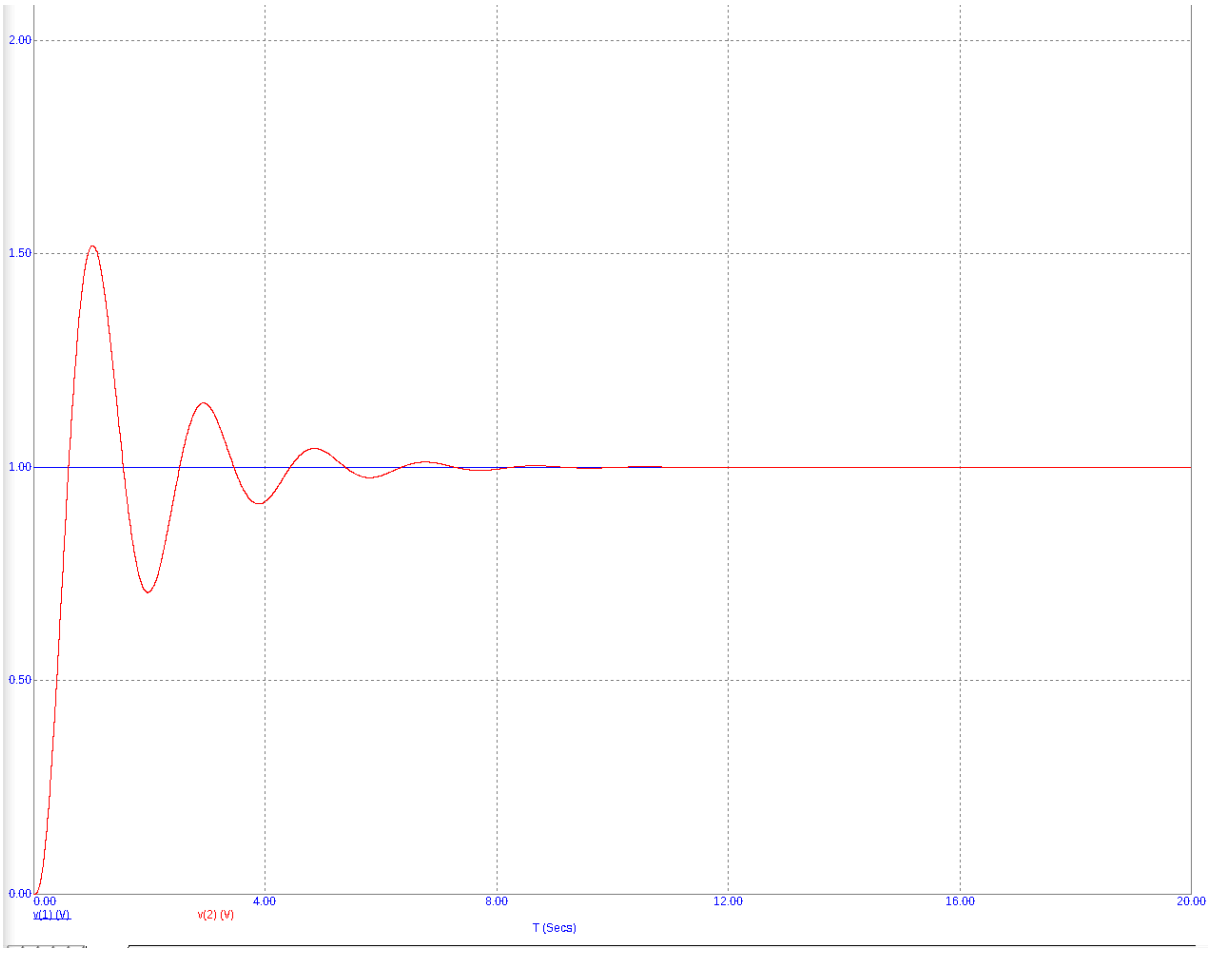


tau = 0.01
error = 0.0007033

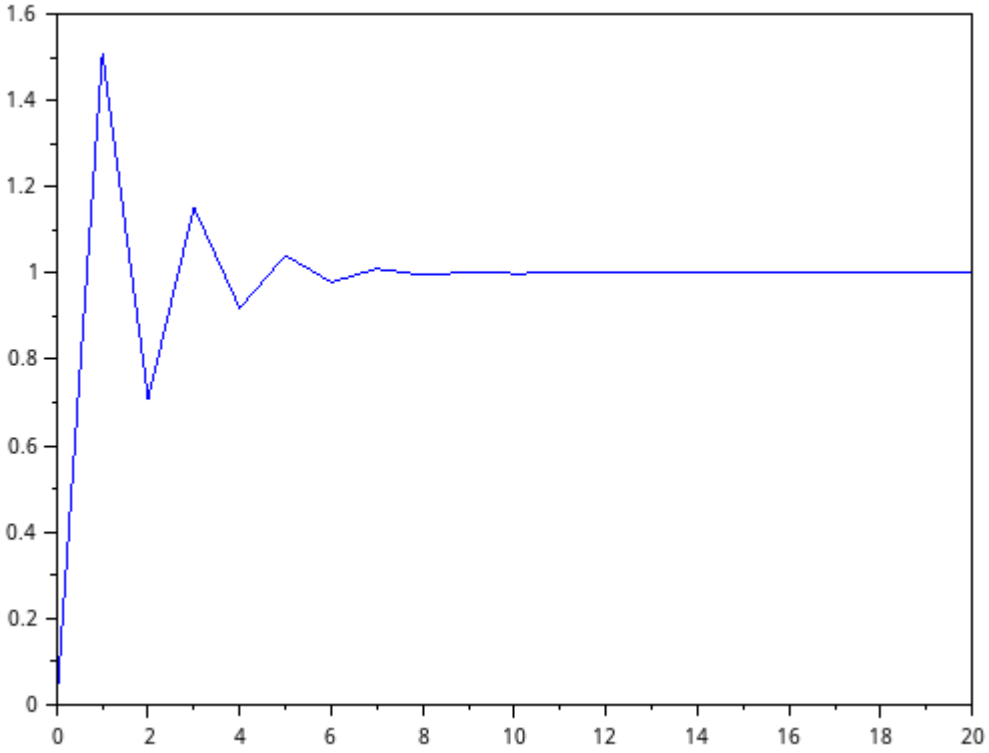


ПИ-регулятор

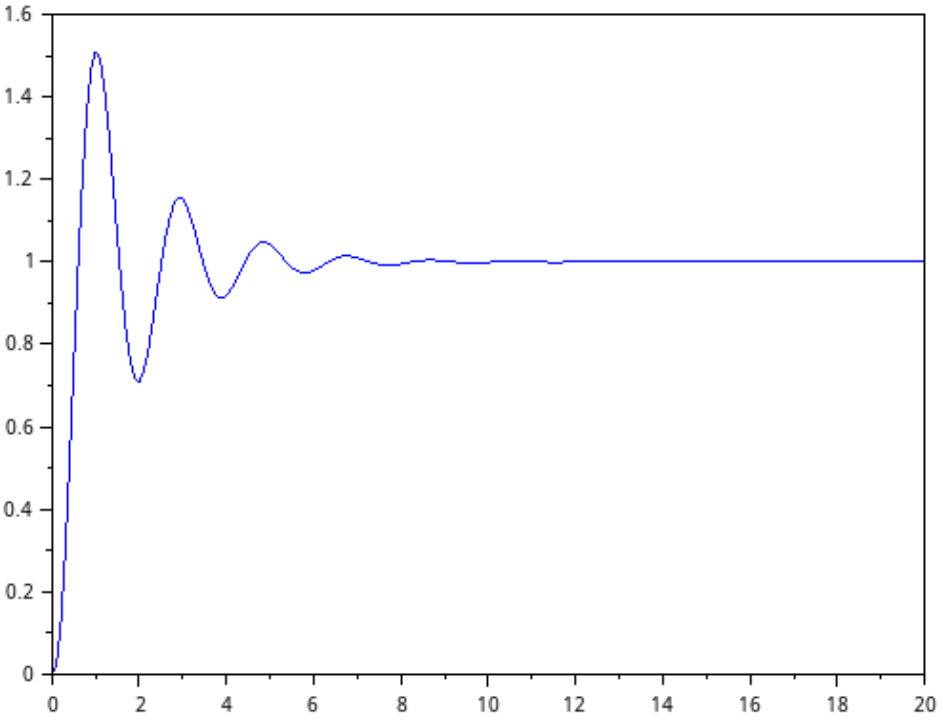
microcap



tau = 1
error = 0.0023138



tau = 0.1
error = 0.0027717



tau = 0.01
error = 0.0026701