

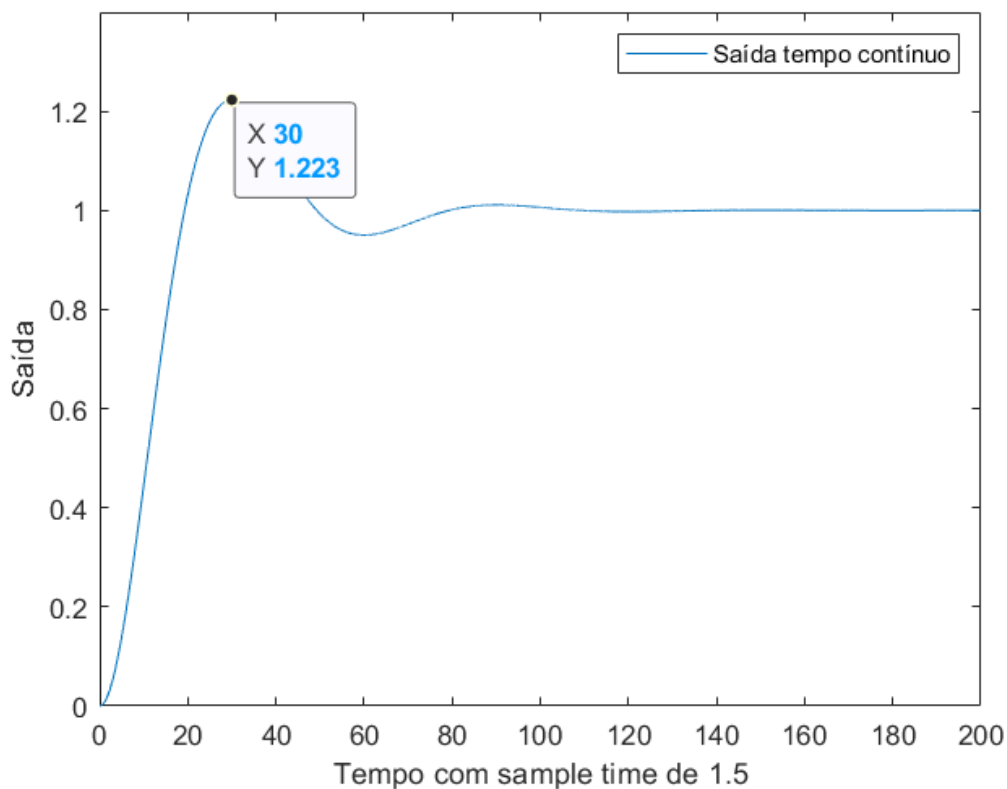
# Controle Digital - Questao 1 - P1

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1.

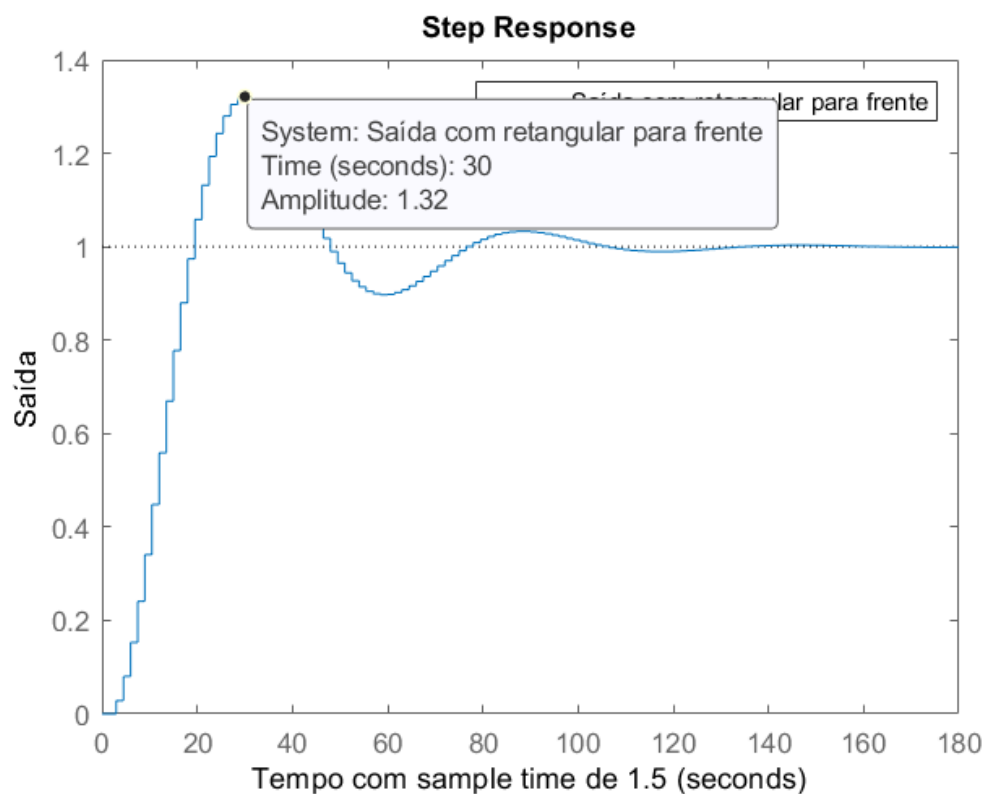
```
wn=0.116;  
zeta=0.4309;  
np=[wn^2];  
dp=[1 2*zeta*wn wn^2];  
sys=tf(np,dp)  
t=0:0.01:200;  
y=step(sys,t);  
plot(t,y)  
xlabel('Tempo com sample time de 1.5')  
ylabel('Saída')  
legend('Saída tempo contínuo')  
hold on
```



```

kc == ((pi^2)/(30^2))+0.05^2)/15
e == exp(-0.15)
G_c_frente == tf([kc*1.5],[1 -1],1.5)
G_c_tras == tf([kc*1.5 0],[1 -1],1.5)
syms s z
G_ghz= tf([15],[1 0.1]);
G_ghz_d == c2d(G_ghz,1.5)
g1 == G_ghz_d*G_c_frente
g1f == feedback(g1,1)
step(g1f)
xlabel('Tempo com sample time de 1.5')
ylabel('Saída')
legend('Saída com retangular para frente')
hold on

```



```

g2 == G_ghz_d*G_c_tras
g2f == feedback(g2,1)
step(g2f)
xlabel('Tempo com sample time de 1.5')
ylabel('Saída')
legend('Saída com retangular para tras')
hold on

```



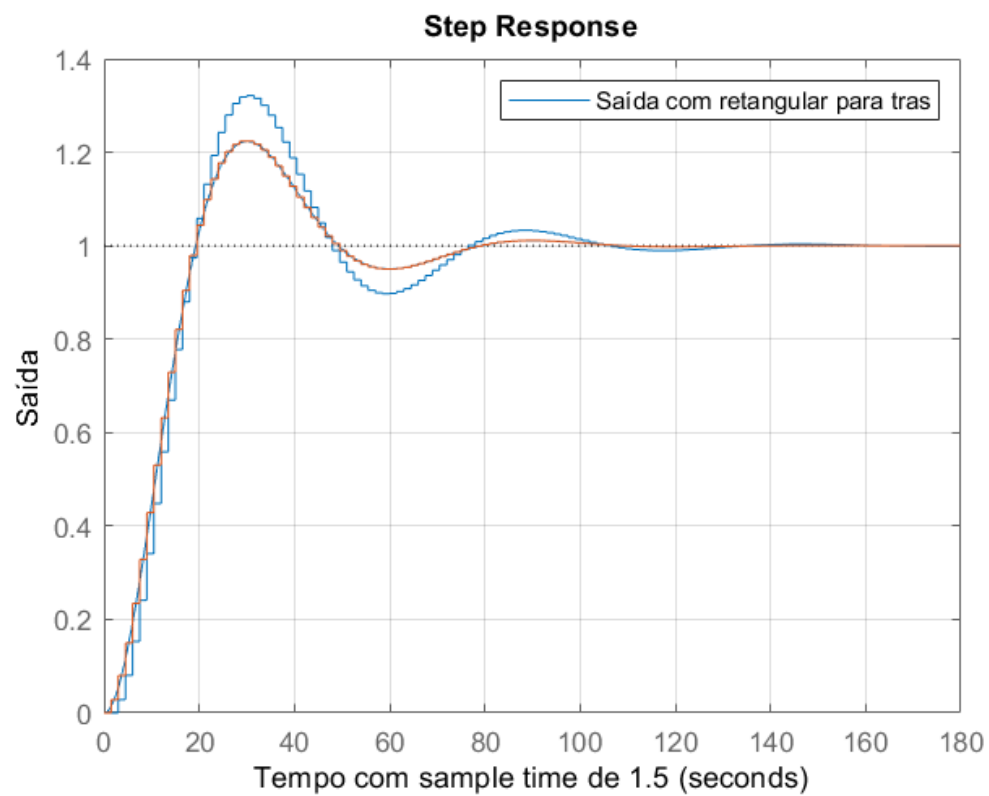


Figure 1. Todos Graficos juntos