

```
% controlador PID sistema de 2a ordem
```

```
t=0:0.01:10;
```

```
wn=1;
```

```
qsi=0.5;
```

```
kp=1;
```

```
kd=1;
```

```
ki=1;
```

```
num1=[kd kp ki];
```

```
den1=[0 1 0];
```

```
num2=[0 0 wn^2];
```

```
den2=[1 2*qsi*wn wn^2];
```

```
controlador=tf(num1,den1)
```

```
planta=tf(num2,den2)
```

```
malhaa=series(controlador,planta)
```

```
realim=tf(1,1)
```

```
malhaf=feedback(malhaa,realim)
```

```
x=step(planta,t);
```

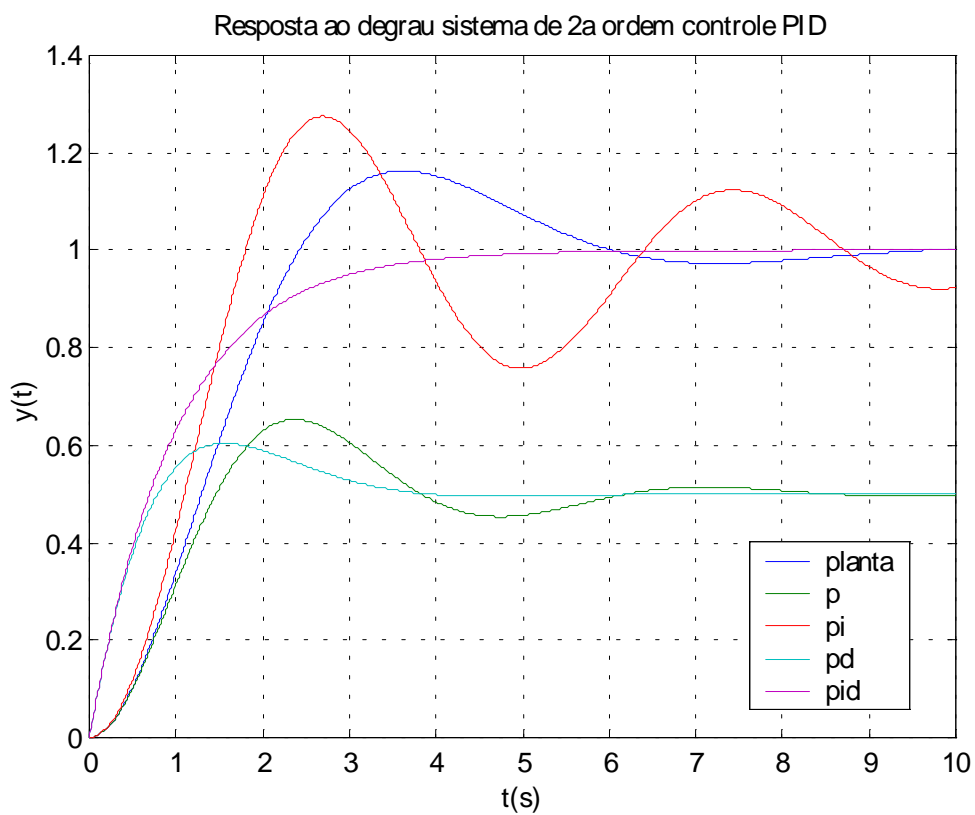
```
xpid=step(malhaf,t);
```

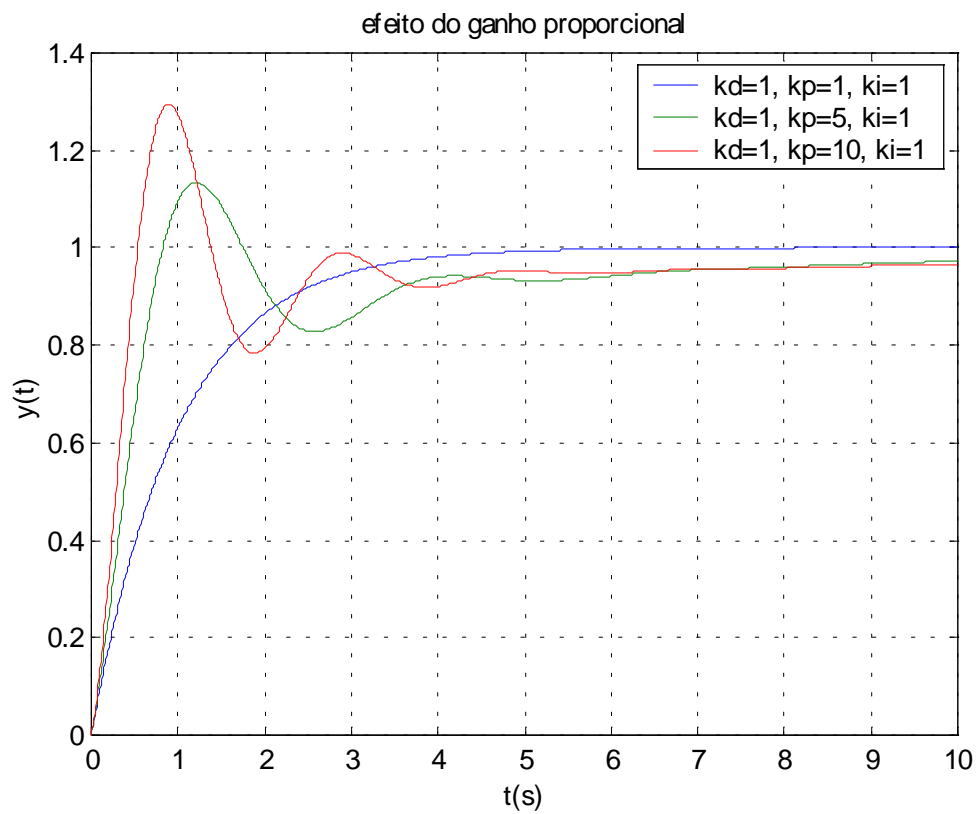
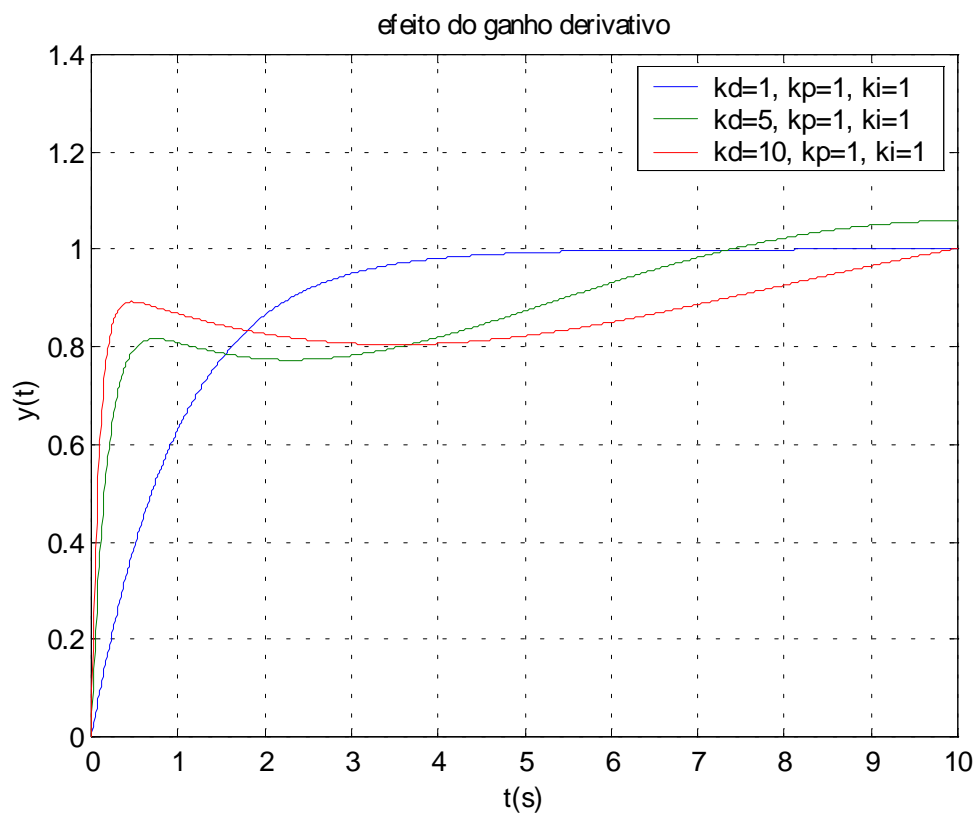
```
kp=1;
```

```
kd=0;
```

```
ki=0;
```

```
etc.
```





efeito do ganho integral

