Gedämpfte Schwingungen

```
clear all
syms t omega alpha
laplace(exp(-alpha*t)*cos(omega*t))
```

ans =

$$\frac{\alpha + s}{(\alpha + s)^2 + \omega^2}$$

```
laplace(exp(-alpha*t)*sin(omega*t))
```

ans =

$$\frac{\omega}{(\alpha + s)^2 + \omega^2}$$

man sieht: mit α und ω kann man getrennt die Dämpfung und die Eigenfrequenz einstellen.

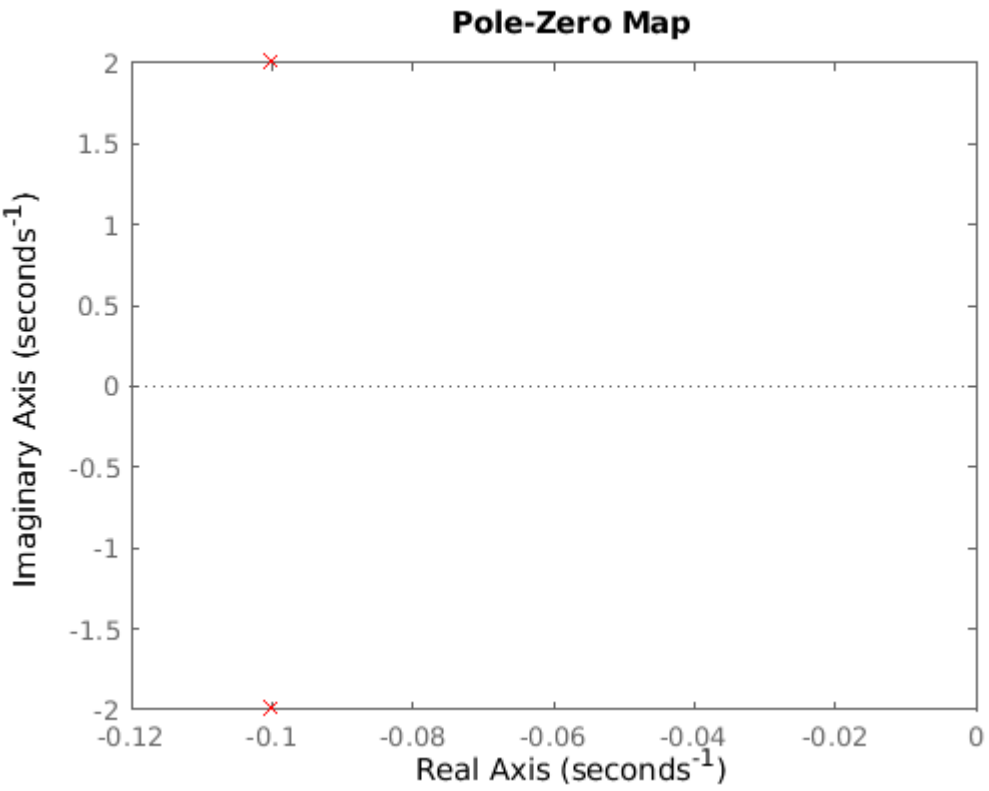
```
s=tf("s");
f=simplify((2)/((s+0.1)^2+2^2))
```

f =

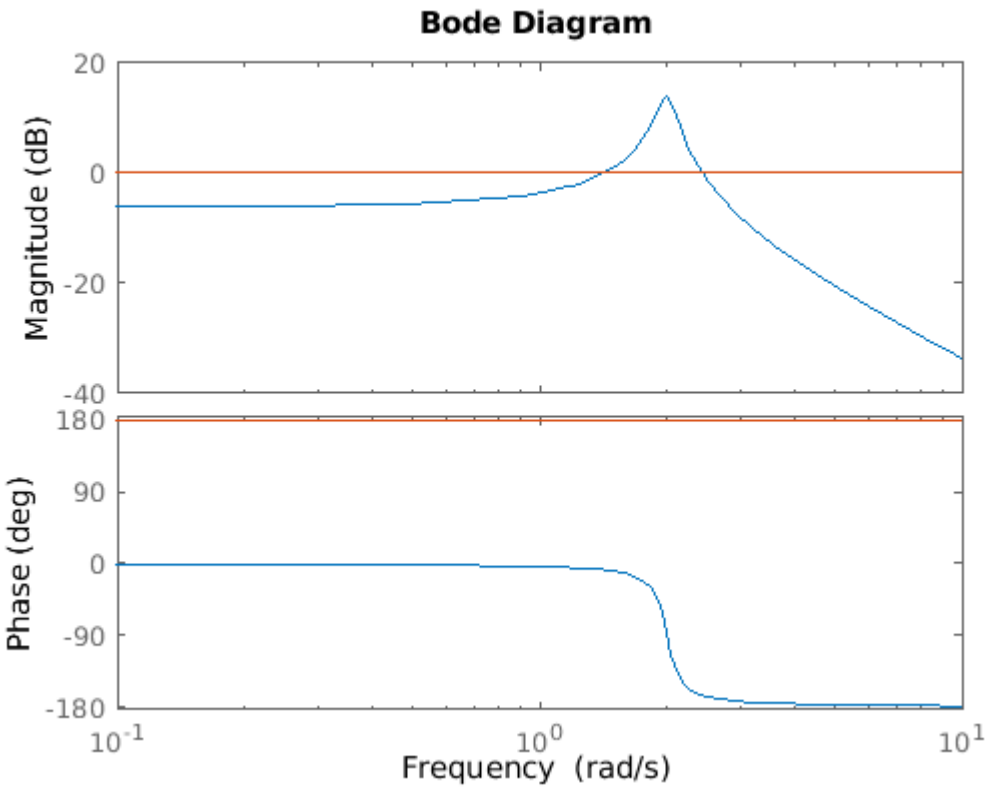
```
          2
-------------------
s^2 + 0.2 s + 4.01
```

Continuous-time transfer function.

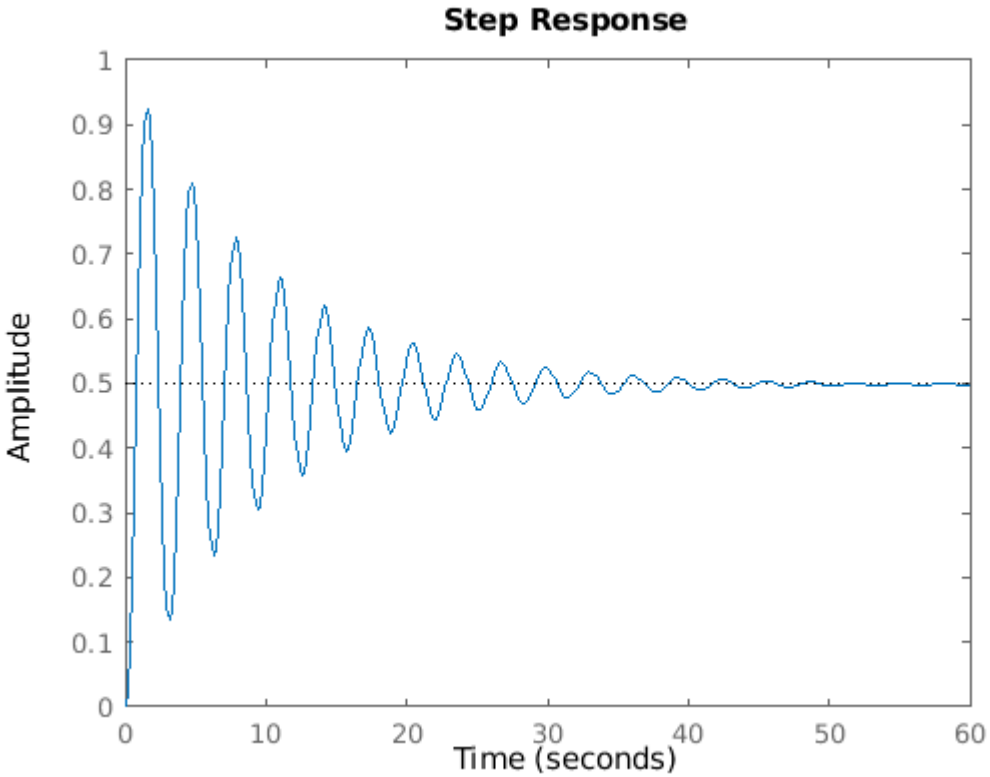
```
pzmap(f,'b');
```



```
bode(f);
hold on;
bode(tf(-1));
hold off;
```




```
stepplot(f);
```




```
impulseplot(f);
```