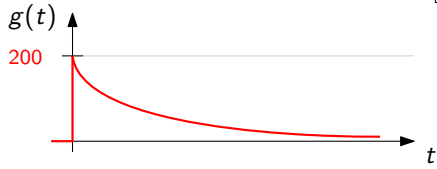
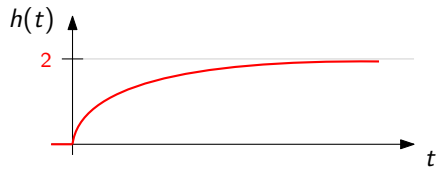
1 PT1

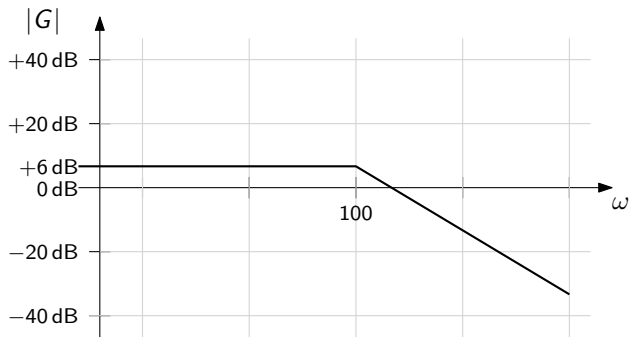
$Dgl.$ $\dot{y} + 100 \cdot y = 200 \cdot u$

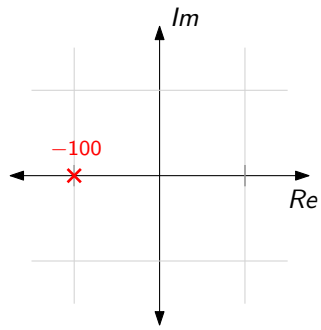
$g(t) =$ $200 \cdot e^{-100t} \cdot \sigma(t)$

$G(s) =$ $\frac{2}{1+0.01s} = \frac{200}{100+s}$



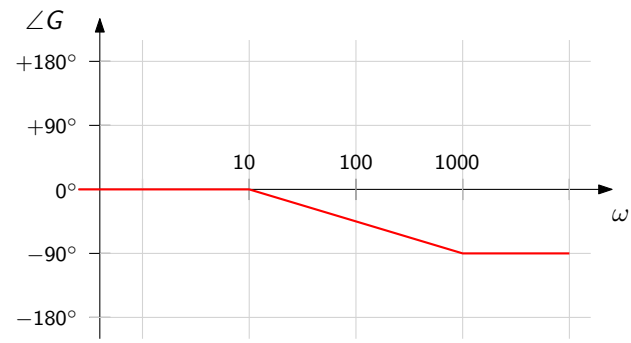


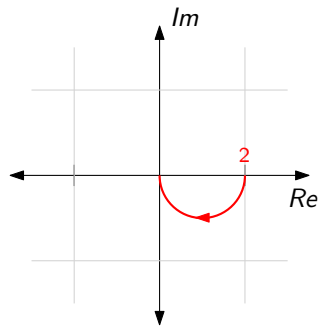




× $s =$ -100

○ $s =$



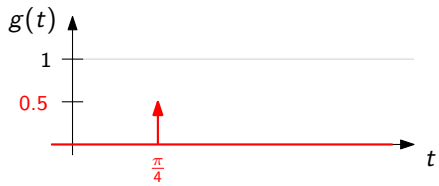


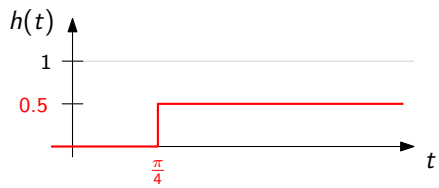
2 Totzeit

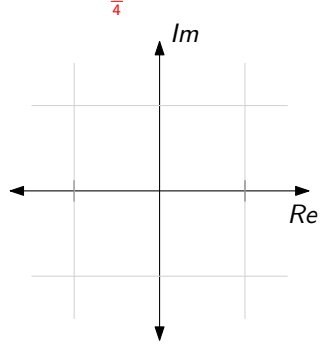
$Dgl.$ $y = 0.5 \cdot u \cdot (t - \frac{\pi}{4})$

$g(t) =$ $y = 0.5 \cdot \delta(t - \frac{\pi}{4})$

$G(s) =$ $y = 0.5 \cdot e^{-s\frac{\pi}{4}}$

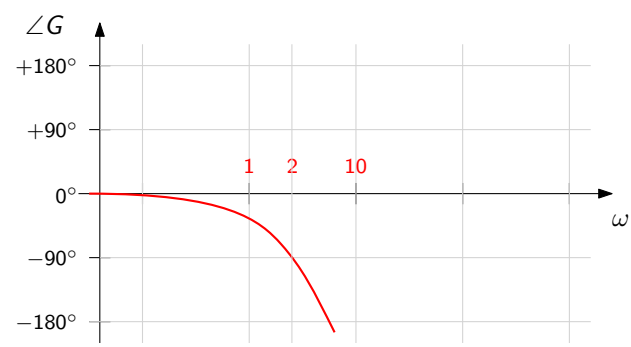


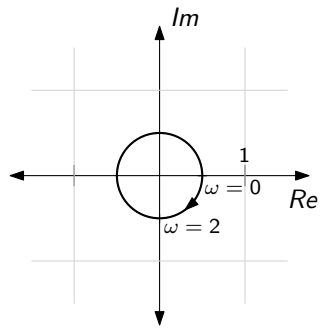




× $s =$

○ $s =$



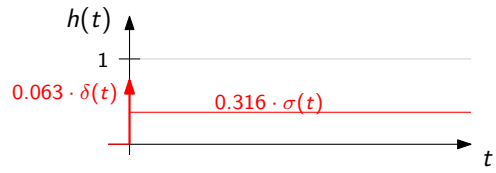


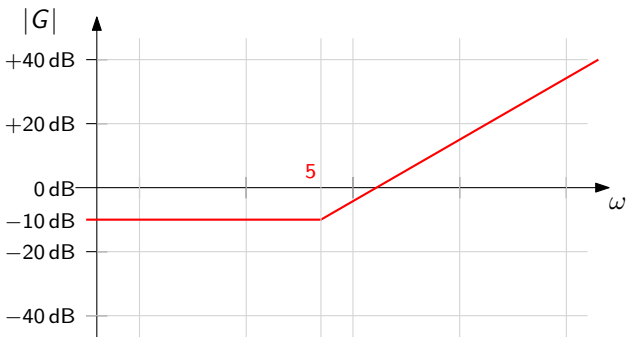
3 PD

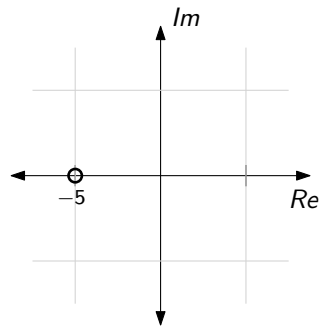
$Dgl.$ $3.16 \cdot y = u + \frac{1}{5} \cdot \dot{u}$

$g(t) =$ $\nexists$

$G(s) =$ $0.316 \cdot (1 + \frac{1}{5}s)$

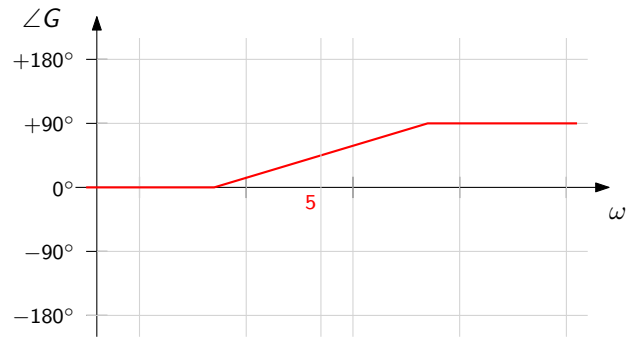


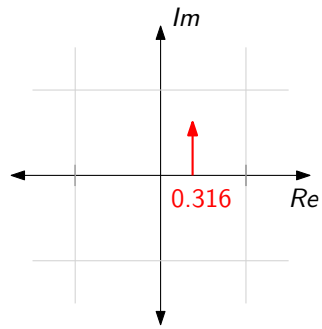




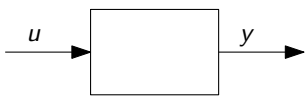
× $s =$

○ $s = -5$





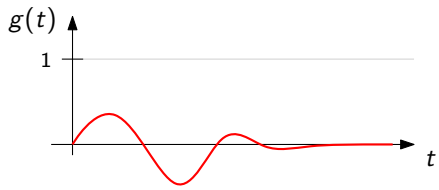
4 PT2

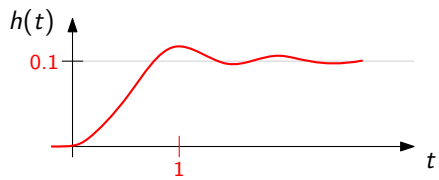


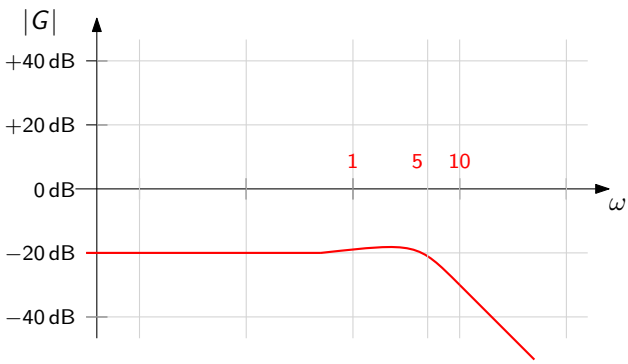
$Dgl.$ $\ddot{y} + 5\dot{y} + 25y = 2.5u$

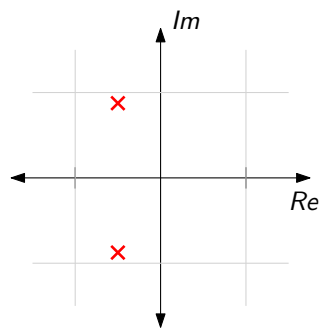
$g(t) =$

$G(s) =$ $\frac{2.5}{s^2+5s+25}$



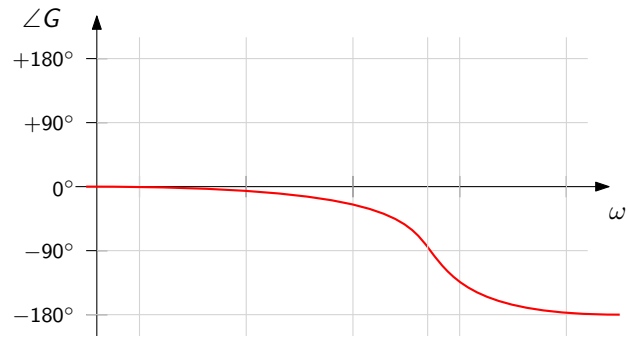


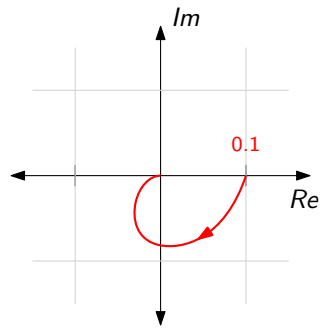




× $s = -2.5 \pm j4.33$

○ $s =$



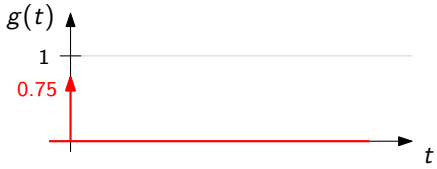


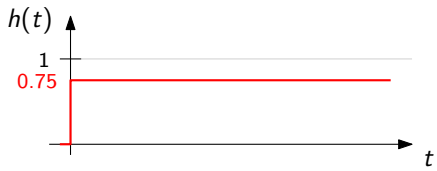
5 P

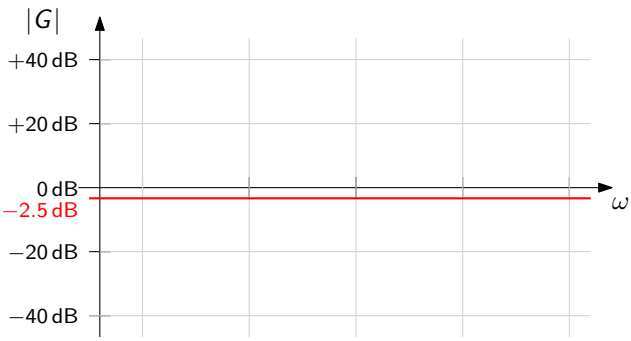
$Dgl.$ $y = 0.75 \cdot u$

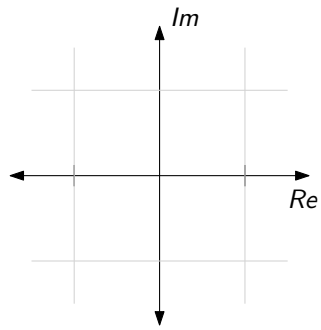
$g(t) =$ $0.75 \cdot \delta(t)$

$G(s) =$ 0.75



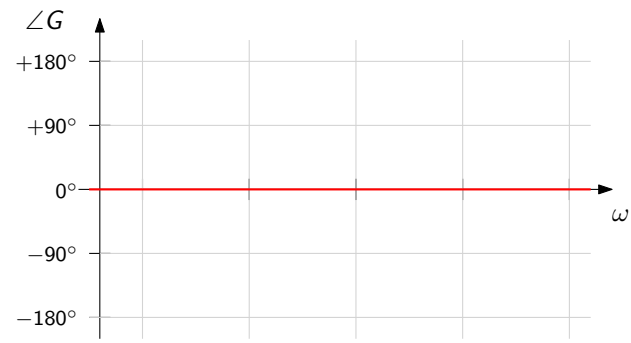


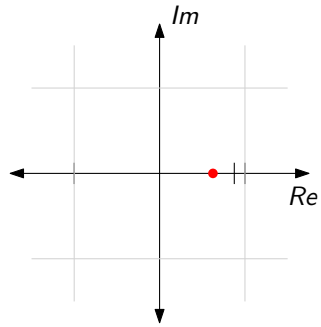




× $s =$

○ $s =$



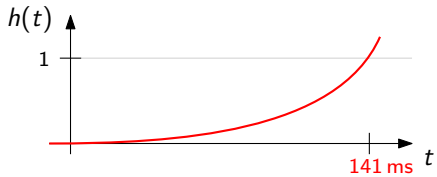


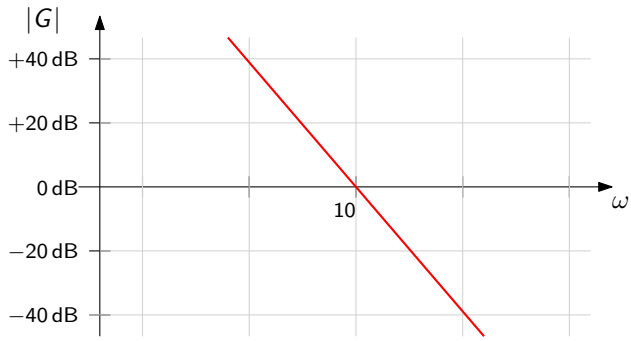
6 I²

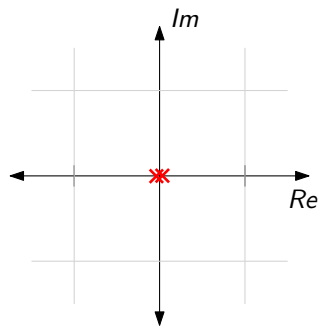
$Dgl.$ $\ddot{y} = 100 \cdot u$

$g(t) =$ $100 \cdot t \cdot \sigma(t)$

$G(s) =$ $\frac{100}{s^2}$

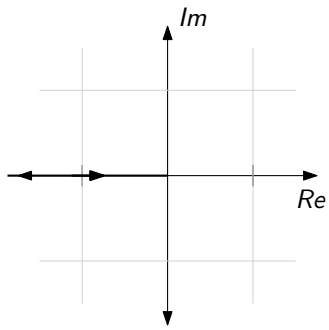






× $s =$ 0, 0 (doppelt)

○ $s =$

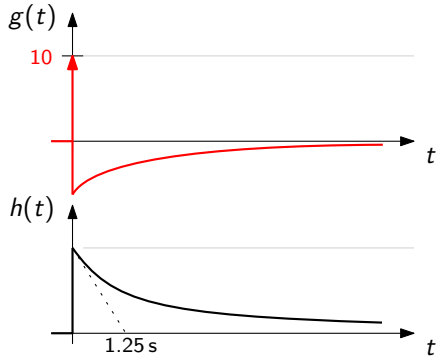


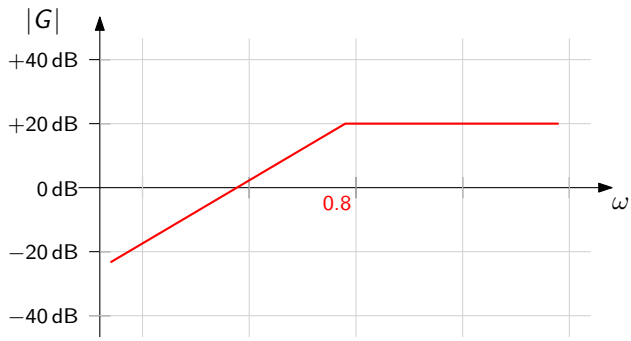
7

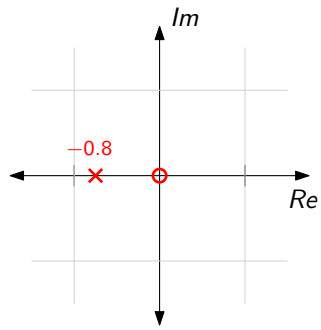
$Dgl.$ $\dot{y} + 0.8 \cdot y = 10 \cdot \dot{u}$

$g(t) =$ $10 \cdot \delta(t) - 8 \cdot e^{-0.8t} \cdot \sigma(t)$

$G(s) =$ $\frac{12.5s}{1+1.25s} = \frac{10s}{s+0.8}$

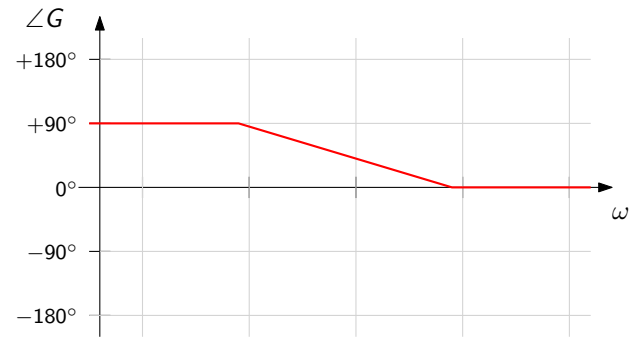


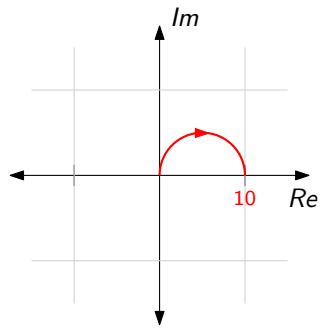




× $s =$ -0.8

○ $s =$ 0





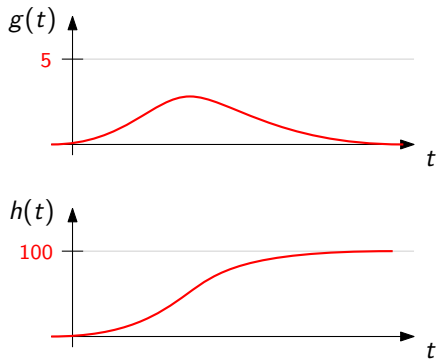
8

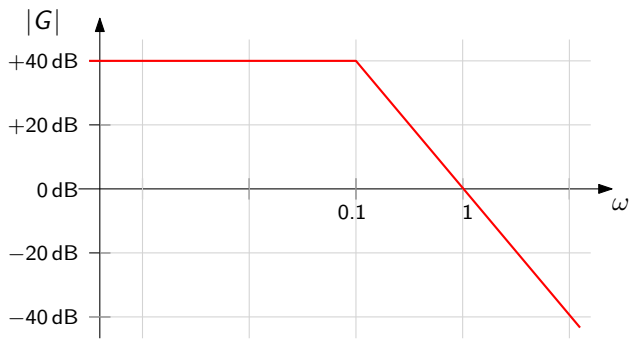
(PT1)²

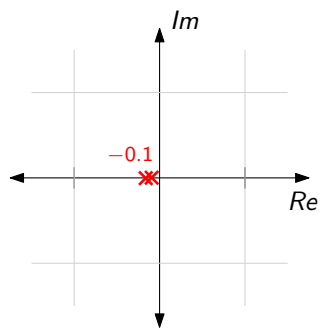
$Dgl.$ $100 \cdot \ddot{y} + 20 \cdot \dot{y} + y = 100 \cdot u$

$g(t) =$ $t \cdot e^{-0.1t} \cdot \sigma(t)$

$G(s) =$ $\frac{k}{(1+sT)^2} = \frac{100}{(1+10s)^2}$

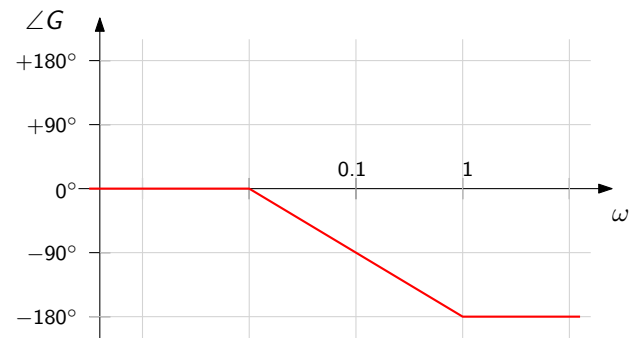


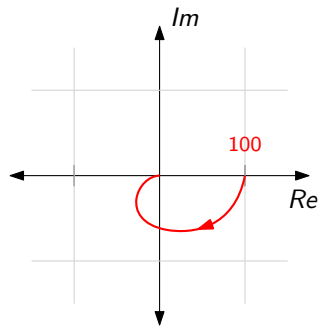




× $s =$ $-0.1, -0.1$

○ $s =$



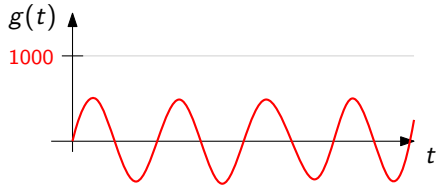


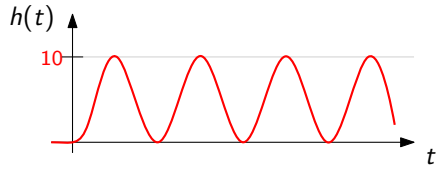
9 PT2

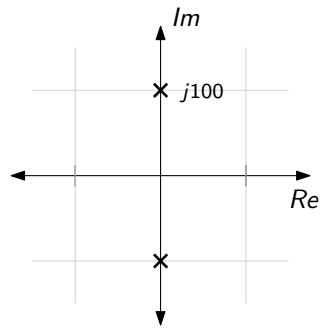
$Dgl.$ $\ddot{y} + 10^4 \cdot y = 5 \cdot 10^4 \cdot u$

$g(t) =$ $500 \cdot \sin(100t) \cdot \sigma(t)$

$G(s) =$ $\frac{5 \cdot 10^4}{s^2 + 10^4} = \frac{5}{1 + 10^{-4} s^2}$

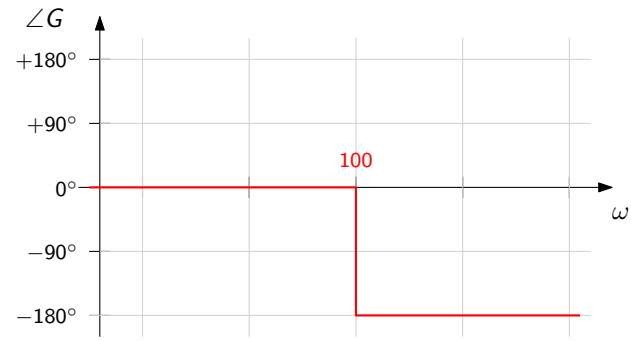


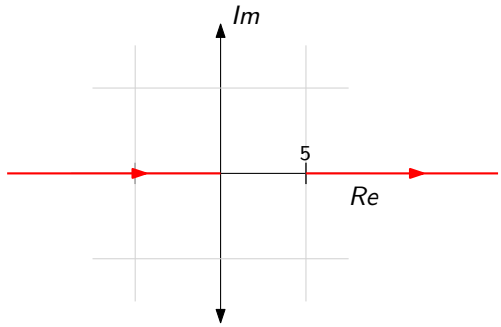




× $s =$ $\pm j100$

○ $s =$



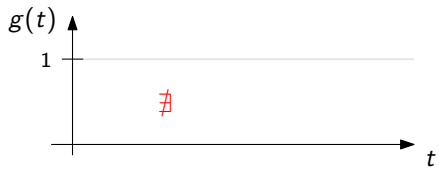


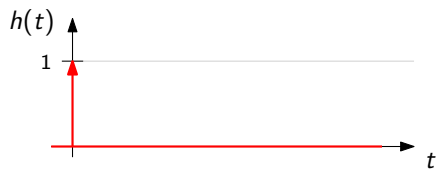
10 D

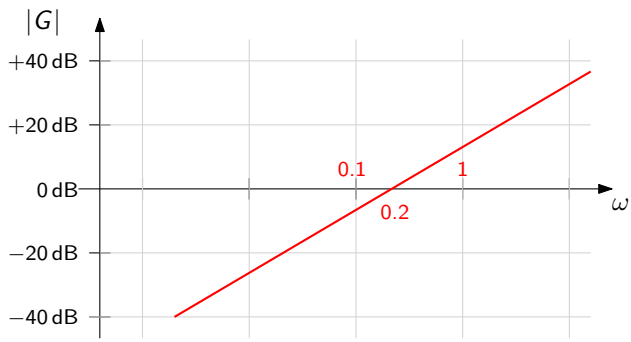
$Dgl.$ $y = 5 \cdot \dot{u}$

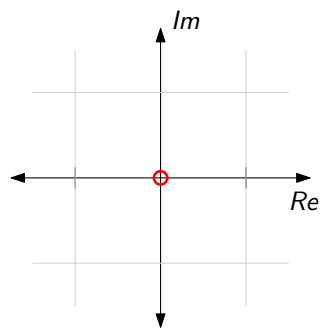
$g(t) =$ $\nexists$

$G(s) =$ $5 \cdot s$



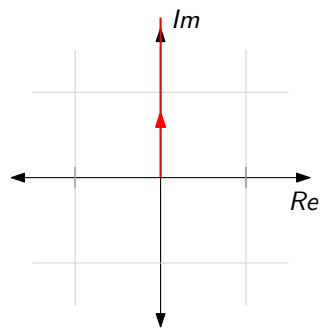






× $s =$

○ $s =$ 0

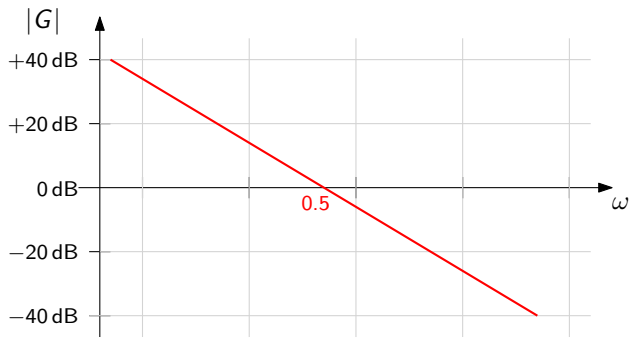


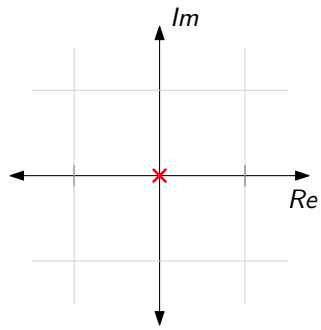
11 I

$Dgl.$ $\dot{y} = 0.5 \cdot u$

$g(t) =$ $0.5 \cdot \sigma(t)$

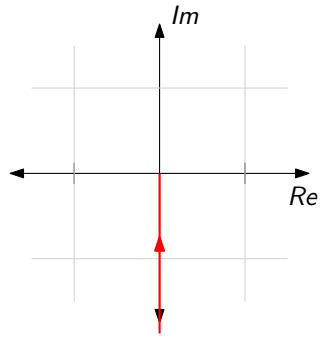
$G(s) =$ $\frac{0.5}{s} = \frac{1}{2s}$





× $s =$ 0

○ $s =$



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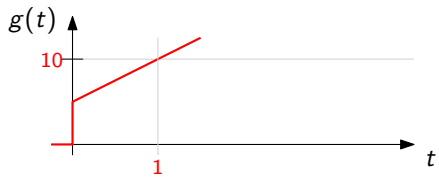
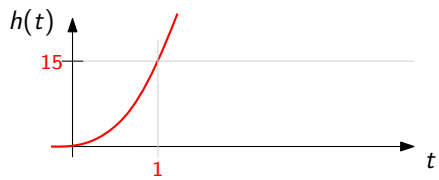
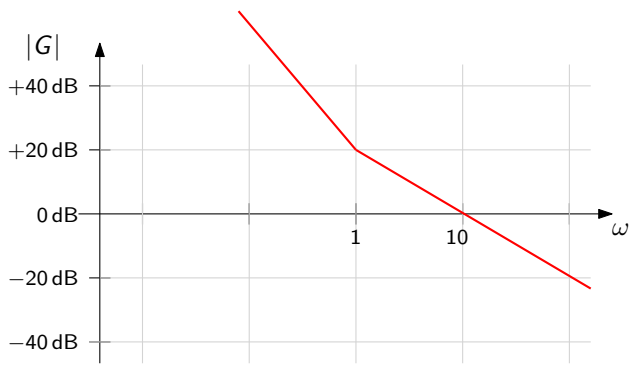
$Dgl.$ $\ddot{y} = 10 \cdot u + 10 \cdot \dot{u}$

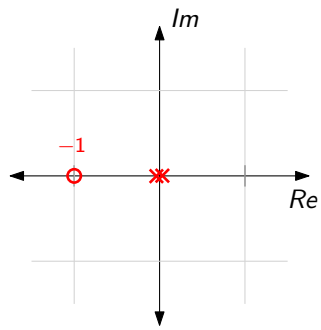
$g(t) =$ $10 \cdot (1 + t) \cdot \sigma(t)$

$G(s) =$ $10 \cdot \frac{1+s}{s^2}$









× $s =$ 0 (doppelt)

○ $s =$ −1