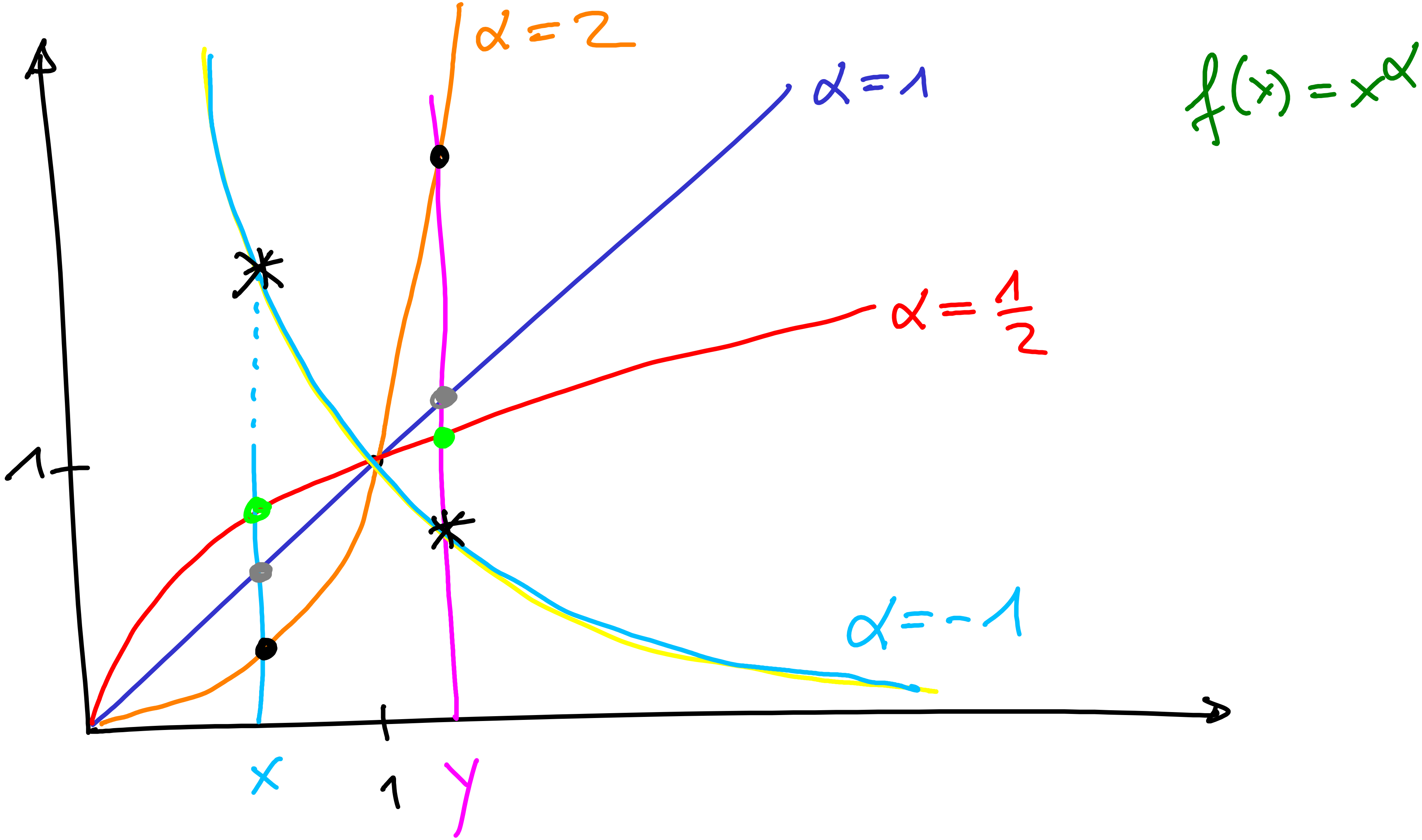
$$(x^2)^3 = (x \cdot x)^3 = (x \cdot x)(x \cdot x)(x \cdot x)$$

$$= x^6 = x^{2 \cdot 3}$$

$$\sqrt[3]{9^{-2} \cdot 3} = \sqrt[3]{(3^2)^{-2} \cdot 3}$$

$$= \sqrt[3]{3^{-4} \cdot 3} = \sqrt[3]{3^{-4+1}}$$

$$= \sqrt[3]{3^{-3}} = (3^{-3})^{1/3} = 3^{-1} = \frac{1}{3}$$



$\alpha = 2$
$\alpha = 1$
$\alpha = \frac{1}{2}$
$\alpha = -1$
$f(x) = x^{\alpha}$
1
x
1
y

$t = \frac{1}{2}$ halbe Jahr

$\alpha = 1{,}06$ 6% Zinsen

$G(0) = 100€$

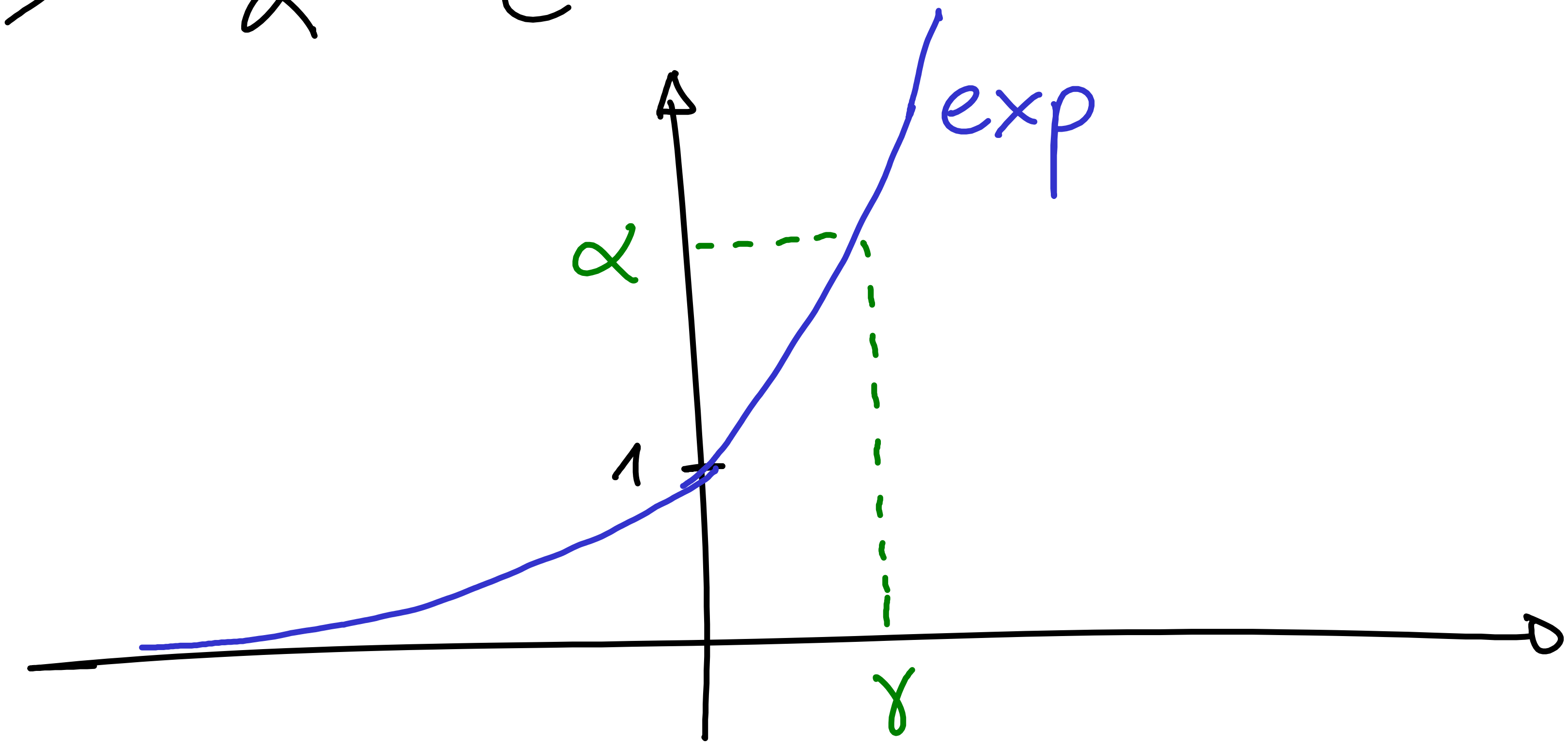
$$G(t) = G(\tfrac{1}{2}) = \alpha^{1/2}\, G(0)$$

$$= \sqrt{1{,}06} \cdot 100€$$

$$\approx 102{,}96€$$

$$\alpha^t = e^{\gamma t} = (e^\gamma)^t$$

$$\Rightarrow \quad \alpha = e^\gamma$$



$(\gamma \in \mathbb{R},\ \alpha > 0)$

$$\alpha^{t/T} = (e^{\gamma})^{t/T} = e^{\frac{\gamma t}{T}}$$

$\alpha = e^{\gamma}$

$$= e^{\lambda t}$$

$\frac{\gamma}{T} = \lambda$

$$G(t) = e^{\lambda t} G(0)$$

$$G\left(\frac{1}{\lambda}\right) = e^{\lambda \frac{1}{\lambda}} G(0) = e \cdot G(0)$$

$$G\left(-\frac{1}{\lambda}\right) = e^{\lambda\left(-\frac{1}{\lambda}\right)} G(0) = \frac{1}{e} G(0)$$

$G(t)$ Menge zu Beginn des Intervalls $[t, t+T]$

$G(t+T)$ Menge am Ende ——— " ———

$$G(t+T) = e^{-\lambda(t+T)} G(0)$$

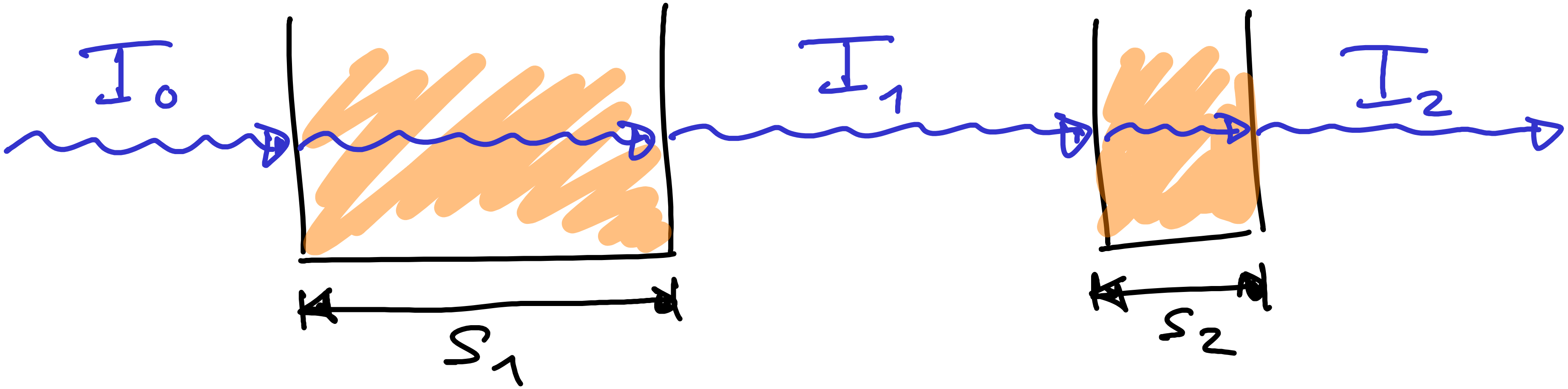
$$= e^{-\lambda T} \cdot \underbrace{e^{-\lambda t} \cdot G(0)}_{G(t)}$$

Verhältnis

$$\frac{G(t+T)}{G(t)} = e^{-\lambda T}$$

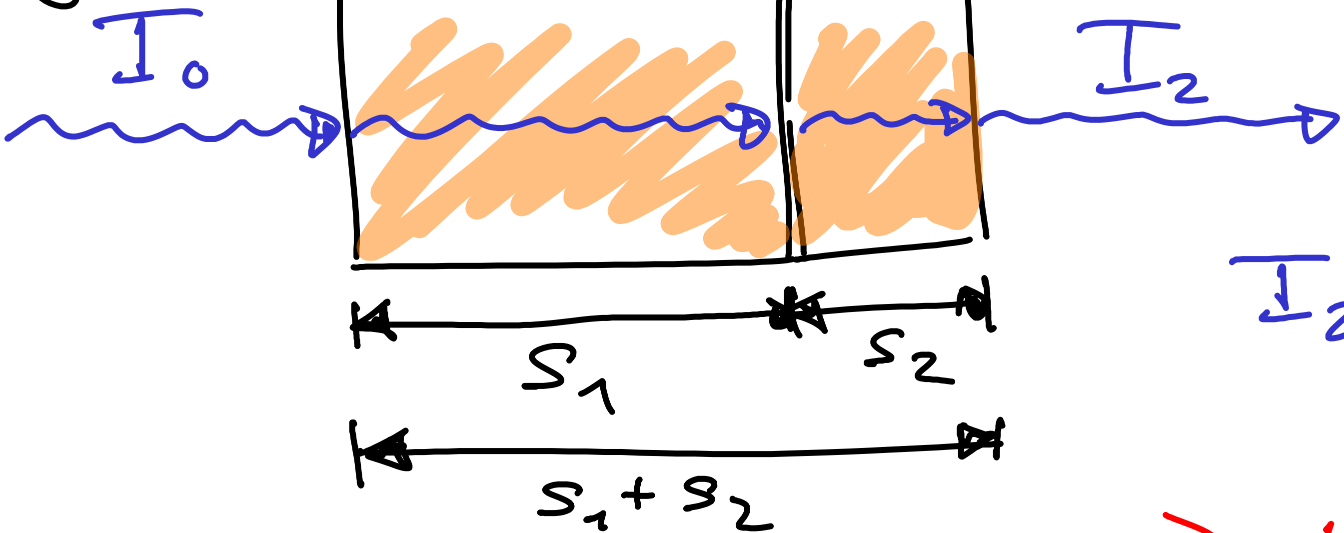
hängt nicht von t ab!

austretende Intensität prop. zu einfallende Intens.



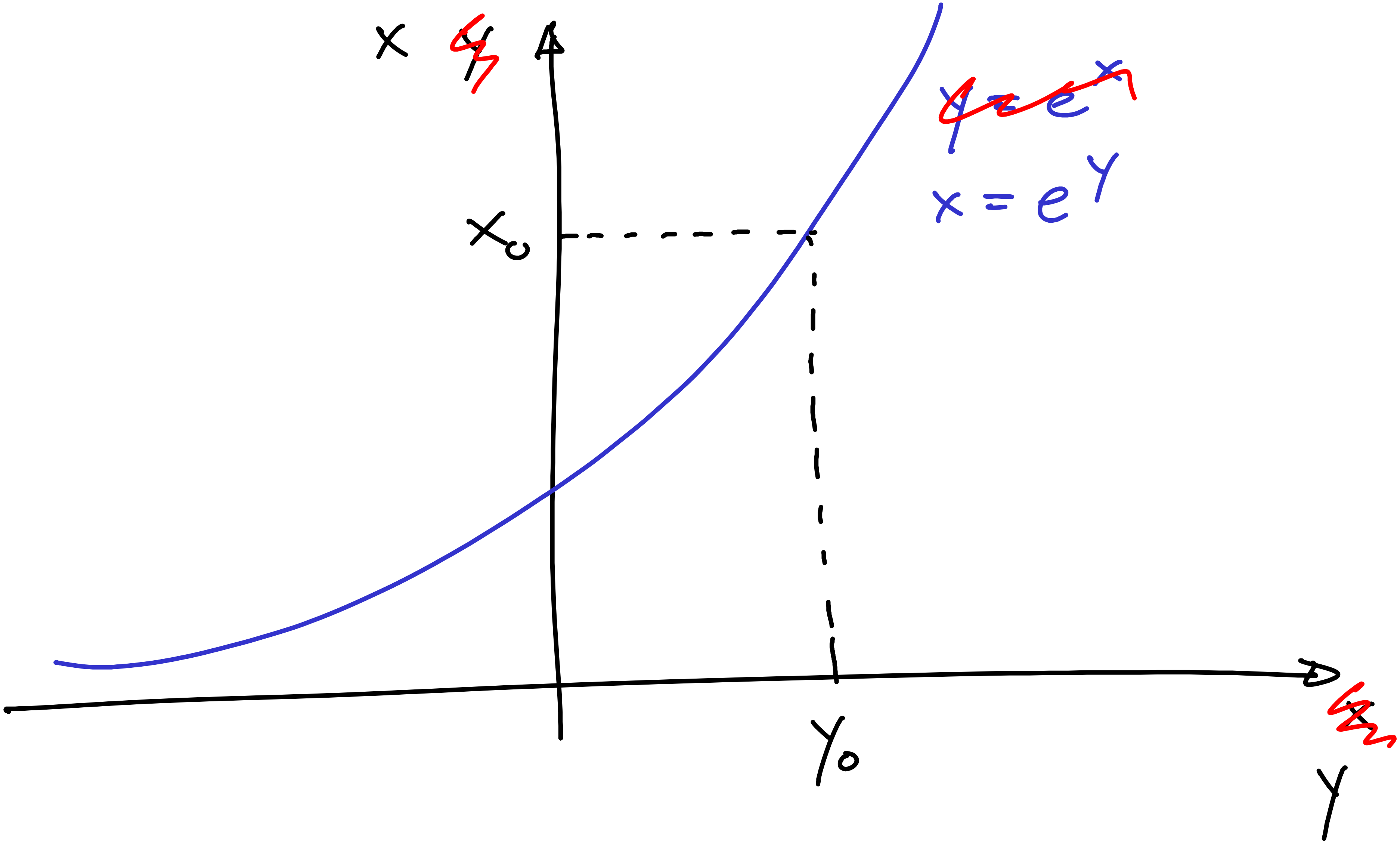
$I_1 = \alpha_{s_1} I_0$, $I_2 = \alpha_{s_2} I_1 = \alpha_{s_1} \cdot \alpha_{s_2} \cdot I_0$

gleiche Absorption für

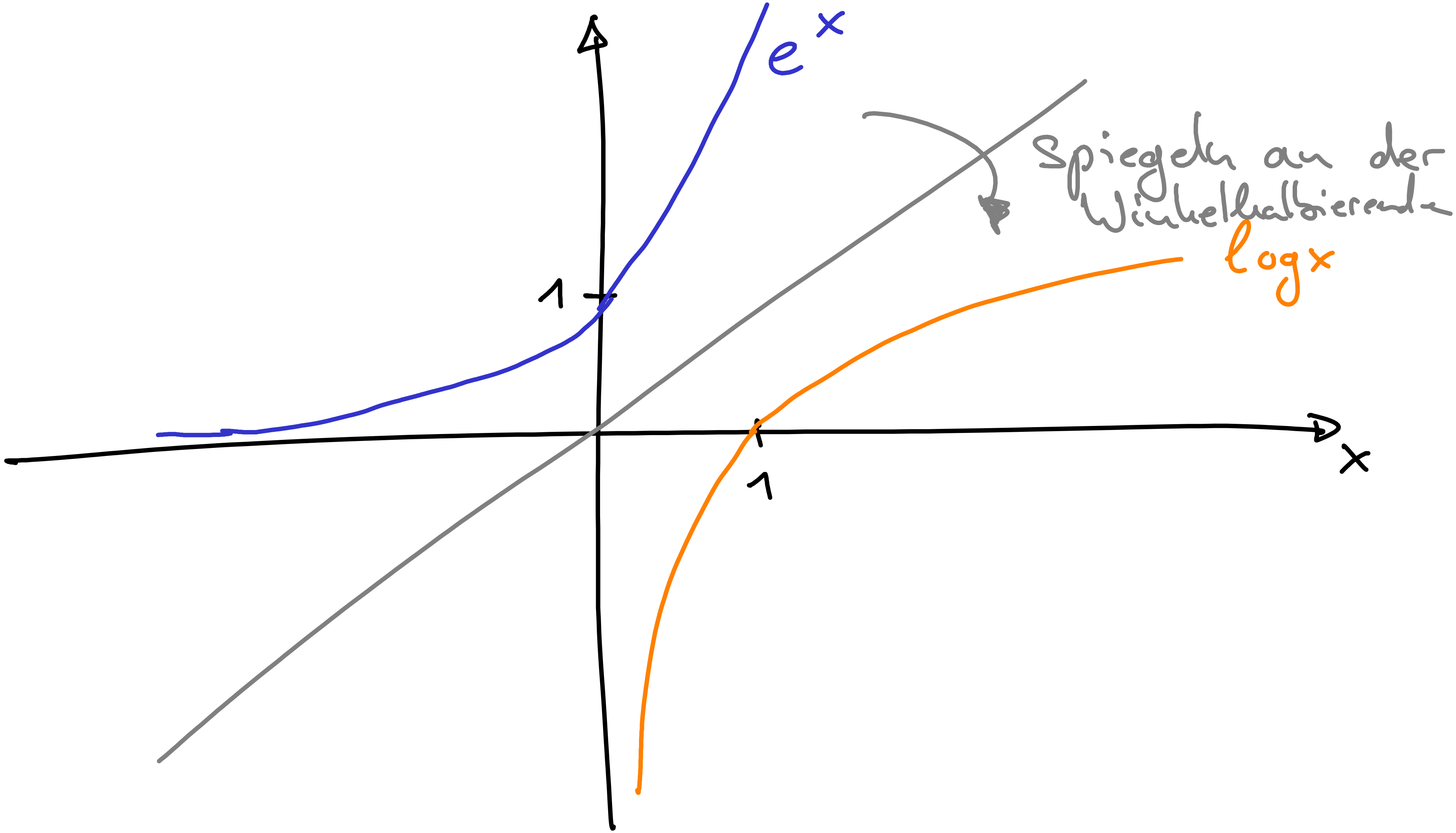


$I_2 = \alpha_{s_1+s_2} I_0$

$\Longrightarrow \alpha_{s_1} \cdot \alpha_{s_2} = \alpha_{s_1+s_2}$



X ~~y~~
x_0
~~$y = e^x$~~
$x = e^y$
y_0
~~x~~
Y



e^x
Spiegeln an der Winkelhalbierenden
$\log x$
1
1
x

$$\log(e^x) = x = e^{\log x}$$

zu zeigen: $\log\left(\frac{1}{x}\right) = -\log x$

$$x = e^y \iff y = \log x \quad (y \in \mathbb{R},\ x > 0)$$

und damit

$$\log\left(\frac{1}{x}\right) = \log\left(\frac{1}{e^y}\right) = \log(e^{-y}) = -y = -\log x$$

Potenz-
rechenregel

Umkehrfunktion