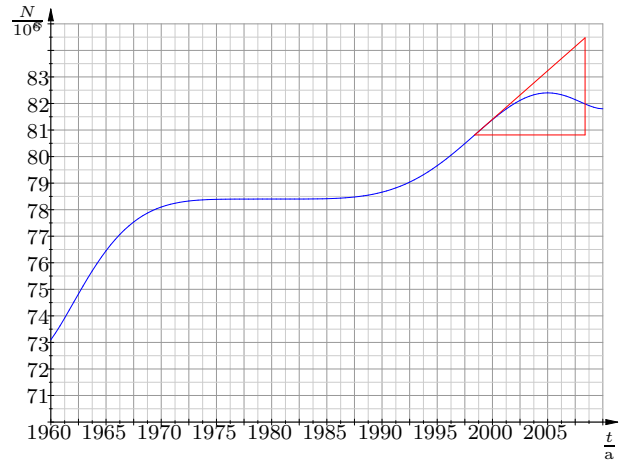
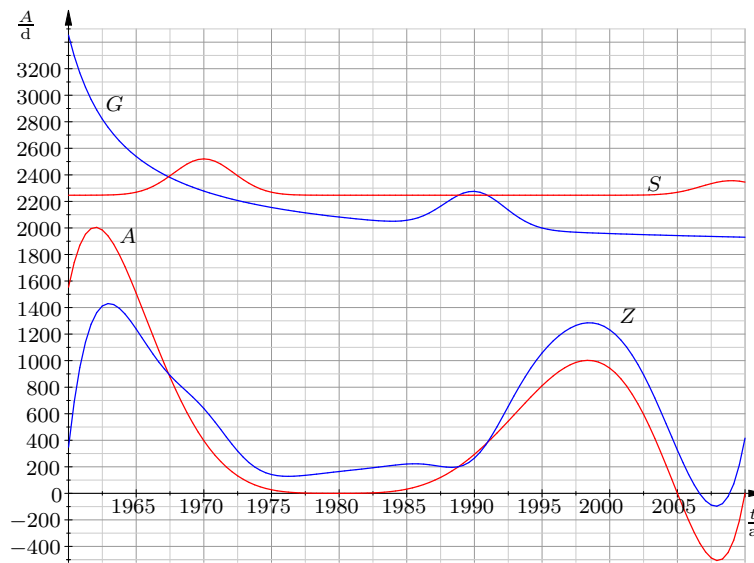


1. (a) A_2 ermitteln wir über ein Steigungsdreieck:
 Steilste Stelle bei
 $t_2 \approx 1998$ a:

$$\begin{aligned} A_2 &\approx \frac{3,7 \cdot 10^6}{10 \text{ a}} = 3,7 \cdot 10^5 \frac{1}{\text{a}} = \\ &= 3,7 \cdot 10^5 \cdot \frac{1}{365 \text{ d}} = \\ &= 1,00 \cdot 10^3 \frac{1}{\text{d}} \end{aligned}$$



- (b)



- (c) Zuwanderungsrate

2. (a) $f(40) = g(40) = 10,4 = y_1$, $y_K = g(180) = 100$, $\overline{LK} = \sqrt{140^2 + 89,6^2} = 166$
 $h = g(180) - f(180) = 2,8$

(b) $f'(x) = \frac{600x - 3x^2}{40000}$, $f'(40) = 0,48 = \tan \varphi_1 \implies \varphi_1 = 25,64^\circ$

$g'(x) = \frac{-2x + 380}{250}$, $g'(40) = 1,2 = \tan \varphi_2 \implies \varphi_2 = 50,19^\circ$, $\varphi = \varphi_2 - \varphi_1 = 24,6^\circ$

(c) $f'(x) = g'(x) \implies \frac{600x - 3x^2}{160} = -2x + 380 \implies 600x - 3x^2 = -320x + 60800$

$$3x^2 - 920x = -60800, \quad x^2 - 2 \cdot \frac{460}{3} x = -\frac{60800}{3}$$

$$x = \frac{460}{3} \pm \sqrt{\frac{460^2 - 3 \cdot 60800}{9}} = \frac{460}{3} \pm \frac{1}{3} \sqrt{29200} = \frac{460}{3} \pm \frac{20}{3} \sqrt{73}$$

$$x_2 = 96,4, \quad (x_{22} = 210,3 \notin D_g)$$