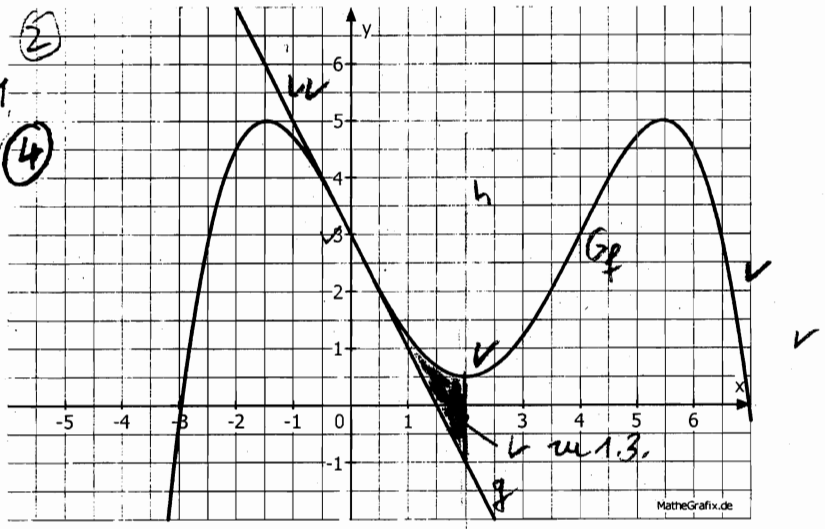
Lösung Analysis 3.SA 5.5.2017 12.Klassen

1.1. (2)

1.2.1 (4)



1.2.2 $f(x)=ax^4+bx^3+cx^2+dx+e$; $f'(x)=4ax^3+3bx^2+2cx+d$

$f''(x)=12ax^2+6bx+2c$

$f(0)=3 \rightarrow \boxed{e=3}$; $f'(0)=-2 \rightarrow \boxed{d=-2}$ $f''(0)=2c \rightarrow 2c=0 \rightarrow \boxed{c=0}$

$f(2)=0,5 \rightarrow 16a+8b-4+3=0,5$ I $16a+8b-1,5=0$

$f'(2)=0 \rightarrow 32a+12b-2=0$ II $2\cdot$I $-$ II: $4b-1=0 \rightarrow \boxed{b=\frac{1}{4}}$ in II

(9)

II $32a+3-2=0 \rightarrow \boxed{a=-\frac{1}{32}}$ $f(x)=-\frac{1}{32}x^4+\frac{1}{4}x^3-2x+3$

1.3. $\int_0^2 (f(x)-g(x))\,dx = \int_0^2 (\frac{1}{32}x^4+\frac{1}{4}x^3)\,dx = \left[-\frac{1}{160}x^5+\frac{1}{16}x^4\right]_0^2 = 0,8$ FE (6)

2.1 $A(a)=\frac{1}{2}\cdot 2a \cdot p(a) = a\cdot(-\frac{2}{3}a^2+6) = -\frac{2}{3}a^3+6a$ $\mathbb{D}_A=]0;3[$ (4)

2.2. $A'(a)=-2a^2+6$ $A'(a)=0 \rightarrow -2a^2+6=0 \rightarrow a^2=3$

$(a_1=-\sqrt{3} \notin \mathbb{D}_A)$ $\boxed{a_2=\sqrt{3}\approx 1,73}$

$A''(a)=-4a$ $A''(\sqrt{3})=-4\sqrt{3}<0 \Rightarrow A_{max}$ für $a=\sqrt{3}$

Basis: $2a=2\cdot\sqrt{3}\approx 3,46$ Höhe: $p(\sqrt{3})=4$

Flächeninhalt $A(\sqrt{3})=4\sqrt{3}\approx 6,93$ (8)