Musterlösung Gruppe A

<table>
<tr><td>1.1</td><td>$f(x) = ax^4 + c\,x^2 + e$ (wegen Symmetrie)
$f(0) = 0 \Rightarrow e=0$

$f(2) = -0{,}5 \Rightarrow 16a + 4c = -0{,}5$ (I)

$f'(2) = 0$ $f'(x) = 4ax^3 + 2cx$ also $32a + 4c = 0$ (II)
(I) – (II) $-16a = -0{,}5 \Rightarrow a = \frac{1}{32}$
$c = -8a = -\frac{1}{4}$</td></tr>
<tr><td>1.2</td><td>$f'(x) = \frac{1}{8}x^3 - \frac{1}{2}x$ $f''(x) = \frac{3}{8}x^2 - \frac{1}{2}$
$f''(2) = \frac{3}{2} - \frac{1}{2} > 0$ also TP</td></tr>
<tr><td>1.3</td><td>
<table>
<tr><td>x</td><td>-4</td><td>-3</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>f(x)</td><td>4</td><td>0,28</td><td>-0,5</td><td>-0,2</td><td>0</td><td>-0,2</td><td>-0,5</td><td>0,28</td><td>4</td></tr>
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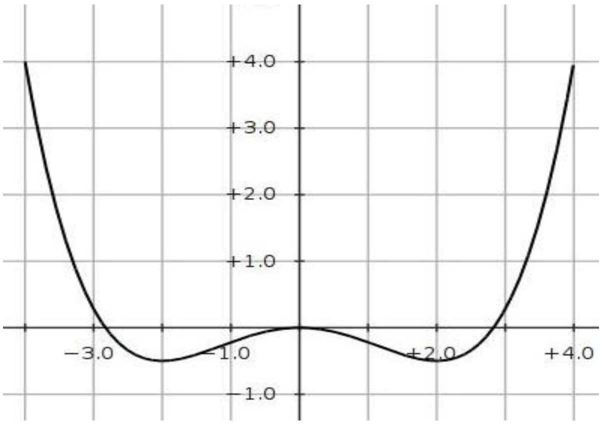
Graph:


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<tr><td>1.4.1</td><td>Sei $g_1(x) = f(x)$ für $x \in$ IR und $g_2(x) = 6x - 20$ für $x \in$ IR
dann gilt:
$g_1(4) = 4$ $g_2(4) = 4$ also stetig
$g_1'(x) = \frac{1}{8}x^3 - \frac{1}{2}x$ also $g_1'(4) = 8-2 = 6$ und $g_2'(4) = 6$ also diffbar.</td></tr>
<tr><td>1.4.2</td><td>Q(4/4) und nicht m = 6 also z.B. m = 0 $\Rightarrow y = 4$</td></tr>
<tr><td>2.1</td><td>$b + h = 28 \Rightarrow h = 28 - b$

$A(b,h) = (b-6)(h-4)$ also $A(b) = (b-6)(24-b) = -b^2 + 30b - 144$

$D_A =]6;24[$</td></tr>
<tr><td>2.2</td><td>$A'(b) = 30 - 2b = 0 \Rightarrow b = 15$ und $h = 13$
$A''(b) = -2 < 0 \Rightarrow$ Max.</td></tr>
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