

S 124 Nr. 7

$$f(x) = x + \sin(x) \quad ; \quad g(x) = x + \cos(x)$$

$$a) f'(x) = 1 + \cos(x) = 2 \Rightarrow \cos(x) = 1 \Rightarrow \underline{\underline{x = 0 + 2 \cdot z \cdot \pi}}, z \in \mathbb{Z}$$

$$\text{Im Intervall } [0; 2\pi] \Rightarrow x_1 = 0 \vee x_2 = 2\pi$$

$$g'(x) = 1 - \sin(x) = 2 \Rightarrow \sin(x) = -1 \Rightarrow \underline{\underline{x = \frac{3}{2}\pi + z \cdot 2\pi}}, z \in \mathbb{Z}$$

$$\text{Im Intervall } [0; 2\pi] \Rightarrow x = \frac{3}{2}\pi$$

$$b) f'(x) = 1 + \cos(x) \geq 0 \Rightarrow f'(x) \text{ kann nie einen VZW haben} \\ \Rightarrow \text{Hinreichende Bedingung f\u00fcr Extrema} \\ \text{nie erf\u00fcllt} \Rightarrow \text{kein Extremum.}$$

$$g'(x) = 1 - \sin(x) \geq 0 \Rightarrow g'(x) \text{ kann keinen VZW haben} \\ \Rightarrow \text{kein Extremum}$$

S 124 Nr. 8

$$f(x) = 2 \sin(x) \quad ; \quad g(x) = x^2 \quad \text{parallele Tangenten}$$

$$\Rightarrow f'(x) = g'(x) \Rightarrow 2 \cdot \cos(x) = 2x \Rightarrow \cos(x) = x$$

$$\text{Mit GTR} \Rightarrow \underline{\underline{x_1 = 0,7391}}$$

$$\left. \begin{array}{l} P_1(x_1 | f(x_1)) = \underline{\underline{(0,7391 | 1,3472)}} \\ P_2(x_1 | g(x_1)) = \underline{\underline{(0,7391 | 0,5463)}} \end{array} \right\} \text{In diesen Punkten} \\ \text{sind die Tangenten parallel}$$

$$f(x) = \sin(x) + 2 \cos(x) \quad ; \quad g(x) = x^3$$

$$f'(x) = \cos(x) - 2 \sin(x) \quad ; \quad g'(x) = 3x^2$$

$$f'(x) = g'(x) \Rightarrow \cos(x) - 2 \sin(x) = 3x^2$$

$$\text{Mit GTR} \Rightarrow \underline{\underline{x_1 = 0,3231}}$$

$$P_1(x_1 | f(x_1)) = \underline{\underline{(0,3231 | 2,2140)}}$$

$$P_2(x_1 | g(x_1)) = \underline{\underline{(0,3231 | 0,0337)}}$$