S 124 Nr. 4

c) $f(x) = 2\sin(x) - \cos(x)$; $x \in [0, 2\pi]$

Extrema: notw. Bed

$f'(x) = 2 \cdot \cos(x) + \sin(x) = 0$

Mit GTR $\Rightarrow$ $\underline{H(2{,}0344 \mid 2{,}2361)}$

$\underline{T(5{,}1760 \mid -2{,}2361)}$

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d) $f(x) = 4 \cdot \cos(x) + 2x$; $x \in [0, 2\pi]$

Extrema: notw Bed

$f'(x) = 4 \cdot (-\sin(x)) + 2 = 0 \Rightarrow 4\sin(x) = 2$

$\sin(x) = \frac{1}{2}$

$\Rightarrow \sin\left(\frac{\pi}{6}\right) = \frac{1}{2} \vee \sin\left(\frac{5}{6}\pi\right) = \frac{1}{2}$

notw Bed.

$f''(x) = -4 \cdot \cos(x)$

$f''\left(\frac{\pi}{6}\right) = -4 \cdot \cos\left(\frac{\pi}{6}\right) < 0 \Rightarrow H\left(\frac{\pi}{6} \mid 4 \cdot \cos\left(\frac{\pi}{6}\right) + 2 \cdot \frac{\pi}{6} = 4 \cdot \frac{1}{2}\sqrt{3} + \frac{\pi}{3}\right)$

$\underline{H\left(\frac{\pi}{6} \mid 2 \cdot \sqrt{3} + \frac{\pi}{3} \approx 4{,}5113\right)}$

$f''\left(\frac{5}{6}\pi\right) = -4 \cdot \cos\left(\frac{5}{6}\pi\right) = -4 \cdot \left(-\frac{1}{2}\sqrt{3}\right) > 0$

$\Rightarrow T\left(\frac{5}{6}\pi \mid 4 \cdot \cos\left(\frac{5}{6}\pi\right) + 2 \cdot \frac{5}{6}\pi = 4 \cdot \left(-\frac{1}{2}\sqrt{3}\right) + 2 \cdot \frac{5}{6}\pi\right)$

$\underline{T\left(\frac{5}{6}\pi \mid -2\sqrt{3} + \frac{5}{3}\pi\right) = \left(\frac{5}{6}\pi \mid \approx 1{,}77189\right)}$