Test in Analysis ◇ Examen en analyse ◇ Type B2 ◇ I / 3

Probl. 1 Berechne $f'(x)$! • *Calculer* $f'(x) \rightsquigarrow$

(a) $f(x) = x^4 + x^6$

(b) $f(x) = x^4 \cdot ln(x)$

(c) $f(x) = \dfrac{x^4}{ln(x)}$

(d) $f(x) = ln(x^4)$

(e) $f(x) = x \cdot e^{(\frac{1}{x})}$

Probl. 2 $f(x) = 7\,x^4 + 12\,x^3 - x^2 + 8\,x + 9 \rightsquigarrow$

(a) $f'(x) = ?$

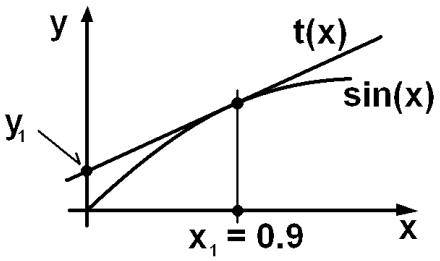
(b) $f''(x) = ?$

(c) $f'''(x) = ?$

(d) Plot: $f,\ f',\ f'',\ f''' \rightsquigarrow\ ?$

Probl. 3

$f(x) = \sin(x) = y,\ \ x:\ rad,\ \ x \in [0, \dfrac{\pi}{2}]$



(a) $f'(x_0) = 0.9 \rightsquigarrow\ x_0 = ?$

(b) $f'(x_0) = \tan(\alpha_0) \rightsquigarrow\ \alpha_0 = ?$
(rad!=

(c) $x_1 = 0.9 \rightsquigarrow\ y_1 = ?$

Probl. 4

$f(x) = a\,x^3 + b\,x^2 + c\,x + d$
$f(2) = 0$
$f'(1) = 1$
$f''(-3) = 0$
$f(3) = -1$

$f(x) = ?$
$a, b, c, d = ?$