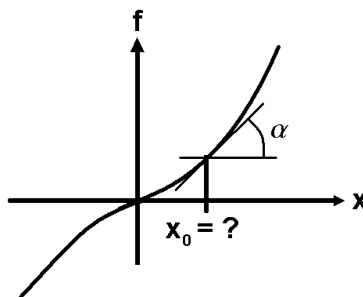


# Übungen in Analysis

◇ E+M I / 9 ◇

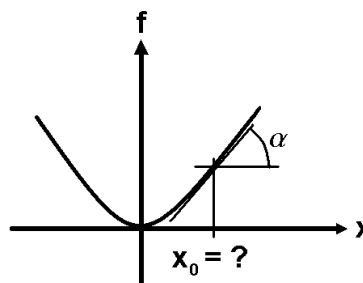
**Probl. 1**  $\alpha = 80^\circ$   $f(x) = x^3$

$x_0 = ?$



**Probl. 2**  $f(x) = x^4$

$\alpha(x_0) = \alpha(1)$



**Probl. 3**  $f(x) = 3x^7 + 9x^4 + 2$

$f'(x) = ?$

**Probl. 4**  $f_1(x) = x^2$ ,  $f_2(x) = ax^2 + bx + c$   
 $f_1(1) = f_2(1)$ ,  
 $f_2(3) = 0$ ,  $f_2(x) \geq 0$

Skizze? Winkel zwischen den Tangenten an die beiden Kurven im Schnittpunkt?

**Probl. 5**  $f(x) = x^2$ ,  $f(x_0) = b$ ,  $f'(x_0) = a$   
 $g(x) = a(x - x_0) + b \rightsquigarrow$  Tangente  
 $g(x_1) = 0 \Rightarrow x_1$

$P_1 = P_1(x_1/0)$ ,  $P_2 = P_2(x_0/0)$   
 $P_3 = P_3(x_0/f(x_0))$ ,  $P_4 = P_4(0/g(0))$   
 $P_5 = P_5(0/0)$

$\rightsquigarrow A(P_1P_2P_3) = ?$ ,  $A(P_1P_4P_5) = ?$

**Probl. 6**  $f(x) = x^2 \cdot \cos(x)$

$\rightsquigarrow f'(x) = ?$

**Probl. 7**  $f(x) = (\sin(x))^3$

$\rightsquigarrow f'(x) = ?$

**Probl. 8**  $f(x) = 3x - \frac{x}{\cos(x)}$

$\rightsquigarrow f'(x) = ?$

**Probl. 9**  $f(x) = x \cdot \sqrt{x}$

$\rightsquigarrow f'(x) = ?$

**Probl. 10**  $f(x) = \frac{1}{x^2} + \frac{x^2}{x^2 + 2}$

$\rightsquigarrow f'(x) = ?$

**Probl. 11**  $f(x) = \sin(2x) (= 2 \sin(x) \cdot \cos(x))$

$\rightsquigarrow f'(x) = ?$

**Probl. 12**  $f(x) = \frac{1}{x} \cdot \frac{\cos(x)}{\sin(x)} \quad \rightsquigarrow \quad f'(x) = ?$

**Probl. 13**  $f(x) = \frac{1}{x^3 - 2x + \cos(x)} \quad \rightsquigarrow \quad f'(x) = ?$

**Probl. 14**  $f(x) = \cos(\sin(\cos(x^4))) \quad \rightsquigarrow \quad f'(x) = ?$