Kapitel 3.9

Allg:

$$L(x) = f(a) + f'(a)(x-a)$$

x-Koordinate = a

y-Koordinate = f(a)

① $f(x) = x^3 - 2x + 3$

$a = 2$

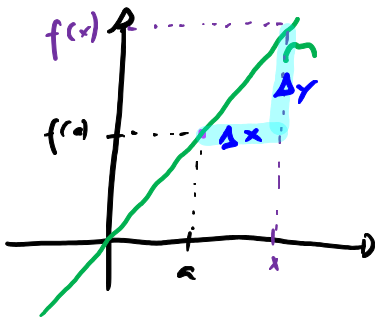
$f(a) = 7$

$f'(x) = 3x^2 - 2$

$f'(a) = f'(2) = 3 \cdot 2^2 - 2 = 10$

$L(x) = 7 + 10(x-2) = 7 + 10x - 20$

$= 10x - 13$



$$m = \frac{f(x) - f(a)}{x - a} \quad | \cdot (x-a)$$

$$m(x-a) = f(x) - f(a) \quad | + f(a)$$

$$L(x) = f(x) = f(a) + m(x-a)$$

$m = f'(a)$

3a

$f(x) = \sin x \qquad a = 0$

$f(0) = \sin 0 = 0$

$f'(x) = \cos x$

$f'(0) = 1$

$L(x) = 0 + 1(x-0)$

$L(x) = x$

⑥

$f(x) = (1+x)^k$

$x = 0$

$a = 0$

$f(0) = (1+0)^k = 1^k = 1$

$f'(x) = k \cdot (1+x)^{k-1}$

$f'(0) = k \cdot (1+0)^{k-1} = k$

$L(x) = 1 + k \cdot (x-0) = 1 + k \cdot x$