5 $f_1(x) = x^2$, $f_2(x) = x^2 - 4x + 8$

$f_1'(x_1) = 2x_1$, $f_2'(x_2) = 2x_2 - 4$ $\qquad x_1 = x_2 - 2$

$P_1, P_2 \rightsquigarrow f_1'(x) = f_2'(x) \Rightarrow 2x_1 = 2x_2 - 4$, $x_2 = x_1 + 2$

$t(x) = \underbrace{f_1(x_1)}_{y_1} + \underbrace{f_1'(x_1)}_{m} \cdot (x - x_1) = f_2(x_2) + f_2'(x_2)(x - x_2)$

$x_1^2 + 2x_1(x - x_1) = x_2^2 - 4x_2 + 8 + (2x_2 - 4)(x - x_2)$

$x_1 = x_2 - 2 \Rightarrow (x_2 - 2)^2 + 2(x_2 - 2)(x - x_2 + 2) = x_2^2 - 4x_2 + 8 + (2x_2 - 4)(x - x_2)$

x fällt raus $\rightsquigarrow$ $x_2 = 3$, $x_1 = 1$

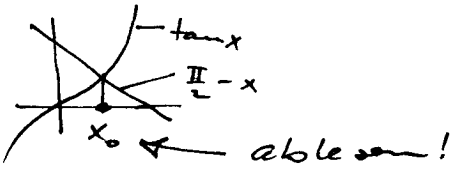
$\rightsquigarrow$ $y_1 = f_1(x_1) = 1$, $y_2 = f_2(x_2) = 3^2 - 4 \cdot 3 + 8 = 9 - 12 + 8 = 5$

$P_1 = P_1(1|1)$, $P_2 = P_2(3|5)$

6 $A(x) = f(x) \cdot (\pi - 2x) = (\sin x)(\pi - 2x)$

$A'(x) = (\cos x)(\pi - 2x) + (\sin x)(-2)$, $2\sin x = (\cos x)(\pi - 2x)$

$\Rightarrow \tan x = \frac{\pi}{2} - x$, Graph!



$x_0 \approx 0.71$ (Rad !!!)

7 $f_1(x) = x^2$, $f_2(x) = x^4$, $d(x) = f_1(x) - f_2(x) = x^2 - x^4$

$d'(x) = 2x - 4x^3 = x(2 - 4x^2) = 2x(1 - 2x^2)$

$d'(x) = 0 \Rightarrow 1 - 2x^2 = 0$ oder $x = 0$. fällt weg!

$\Rightarrow 1 - 2x^2 = 0$, $x^2 = \frac{1}{2}$, $x = \pm\frac{1}{\sqrt{2}}$

fällt weg!

$\Rightarrow x = \frac{1}{\sqrt{2}} \approx 0{,}707\ldots$

8 Bitte beachten!