# Aufgaben Tangenten 1

1.) $P_0(2|2)$

$f'(x) = 3x^2 - 12x + 9$

$2 = -3 \cdot 2 + n \quad n = 8$

$y = -3x + 8$

$f(2) = 8 - 24 + 18 = 2$

$f'(2) = -3$

2.) $P_0(2|2{,}75)$

$f'(x) = \frac{3}{4}x^2 - \frac{9}{2}x + \frac{15}{4}$

$2{,}75 = -2{,}25 \cdot 2 + n$

$n = 7{,}25$

$y = -2{,}25x + 7{,}25$

$f(2) = 2 - 9 + 7{,}5 + 2{,}25 = 2{,}75$

$f'(2) = 3 - 9 + 3{,}75 = -2{,}25$

3.) $P_0(-1|7)$

$f'(x) = \frac{3}{2}x^2 - x - 4$

$7 = -\frac{3}{2} \cdot (-1) + n \quad n = \frac{11}{2}$

$y = -\frac{3}{2}x + \frac{11}{2}$

$f(-1) = -\frac{1}{2} - \frac{1}{2} + 4 + 4 = 7$

$f'(-1) = \frac{3}{2} + 1 - 4 = -\frac{3}{2}$

5.) $P_0(1|0{,}5)$

$f'(x) = \frac{3}{2}x^2 - x - \frac{5}{2}$

$0{,}5 = -2 \cdot 1 + n \quad n = 2{,}5$

$y = -2x + 2{,}5$

$f(1) = \frac{1}{2} - \frac{1}{2} - \frac{5}{2} + 3 = \frac{1}{2}$

$f'(1) = \frac{3}{2} - 1 - \frac{5}{2} = -2$

4.) $P_0(1|2)$

$f'(x) = 3x^2 + 6x$

$2 = 9 \cdot 1 + n \quad n = -7$

$y = 9x - 7$

$f(1) = 2$

$f'(1) = 9$

6.) $P_0\left(-\frac{3}{2} \mid -\frac{1}{8}\right)$

$f'(x) = 3x^2 - 2x - 5$

$-0{,}125 = 4{,}75 \cdot (-1{,}5) + n$

$n = 7$

$\underline{y = 4{,}75x + 7}$

$f\left(-\frac{3}{2}\right) = -\frac{27}{8} - \frac{9}{4} + \frac{15}{2} - 2$

$= -\frac{1}{8}$

$f'\left(-\frac{3}{2}\right) = \frac{27}{4} + \frac{6}{2} - 5$

$= 4{,}75$

7.) $P_0(3 \mid -3)$

$f'(x) = \frac{3}{4}x^2 - \frac{5}{2}x + \frac{1}{2}$

$-3 = -\frac{1}{4} \cdot 3 + n \qquad n = -\frac{9}{4}$

$\underline{y = -\frac{1}{4}x - \frac{9}{4}}$

$f(3) = \frac{27}{4} - \frac{45}{4} + \frac{3}{2}$

$= -3$

$f'(3) = \frac{27}{4} - \frac{15}{2} + \frac{1}{2}$

$= -\frac{1}{4}$

8.) $P_0\left(1 \mid -\frac{9}{2}\right)$

$f'(x) = 3x^2 - 3x - 6$

$-\frac{9}{2} = -6 \cdot 1 + n \qquad n = \frac{3}{2}$

$\underline{y = -6x + \frac{3}{2}}$

$f(1) = 1 - \frac{3}{2} - 6 + 2$

$= -\frac{9}{2}$

$f'(1) = -6$

9.) $P_0(0 \mid 4)$

$f'(x) = \frac{3}{2}x^2 - x - 4$

$4 = -4 \cdot 0 + n \qquad n = 4$

$\underline{y = -4x + 4}$

$f(0) = 4$

$f'(0) = -4$

10.) $P_0(1 \mid 0)$

$f'(x) = x^2 - \frac{2}{3}x - 4$

$0 = -\frac{11}{3} \cdot 1 + n \qquad n = \frac{11}{3}$

$\underline{y = -\frac{11}{3}x + \frac{11}{3}}$

$f(1) = \frac{1}{3} - \frac{1}{3} - 4 + 4 = 0$

$f'(1) = 1 - \frac{2}{3} - 4 = -\frac{11}{3}$