Musterlösung 2St / Vorkurs

1. $\begin{array}{rll} \text{I} & 6x + 5y = -36 & \cdot 3 \\ \text{II} & 7x - 3y = 11 & \cdot 5 \end{array}$

$\begin{array}{rll} \text{I}' & 18x + 15y = -108 & \checkmark \\ \text{II}' & 35x - 15y = 55 & \end{array}$

$\text{I}' + \text{II}' \quad 53x = -53 \quad \checkmark$

$x = -1 \quad \checkmark$

in I $-6 + 5y = -36 \Rightarrow y = -6 \quad \checkmark \quad \mathbb{L} = \{(-1; -6)\} \quad \checkmark$ 4

2. $f(x) = -0{,}5x^2 + x + 1{,}5$ $\quad T(0|1{,}5) \checkmark$

2.1 Nst.: $-0{,}5x^2 + x + 1{,}5 = 0 \quad \checkmark$ $\quad x_{1,2} = \frac{-1 \pm \sqrt{1 - 4(-0{,}5) \cdot 1{,}5}}{2(-0{,}5)} \checkmark \quad \frac{-1 \pm 2}{-1} \checkmark$

$x_1 = -1 \quad x_2 = 3 \checkmark \quad T_2(-1|0) \; T_3(3|0)$ 4

2.2 $x_S = \frac{-b}{2a} \quad x_S = \frac{-1}{2(-0{,}5)} = 1 \checkmark \quad S(1|2) \checkmark \quad \mathbb{W} =]-\infty; 2] \checkmark$ 3

2.3 $f(x) = -0{,}5(x - 3)(x + 1) \checkmark$

$f(x) = -0{,}5(x - 1)^2 + 2 \checkmark$ 3

2.4 $-0{,}5x^2 + x + 1{,}5 = -x + 1{,}5 \checkmark$

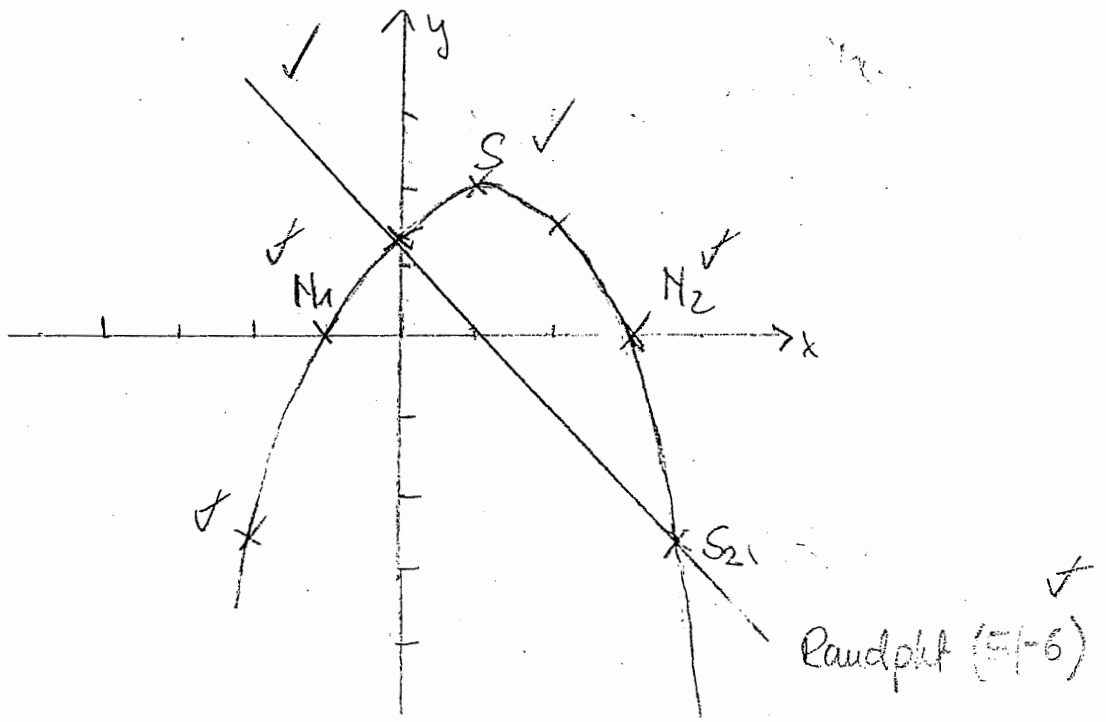
$-0{,}5x^2 + 2x = 0 \quad \checkmark$

$x(-0{,}5x + 2) = 0 \quad \checkmark \quad x_1 = 0 \quad \checkmark \quad x_2 = 4 \quad \checkmark$

$S_1(0|1{,}5) \quad \checkmark$

$S_2(4|-2{,}5) \quad \checkmark$ 4

2.5 $G_g \checkmark \quad G_p \checkmark\checkmark$ (S ✓, N_S ✓, Randpunkte ✓)



4

2.6 $-0{,}5x^2 + x + 1{,}5 = -3x + a$ ✓ $|+3x$

$-0{,}5x^2 + 4x + 1{,}5 - a = 0$ ✓

$x_{1,2} = \frac{-4 \pm \sqrt{4^2 - 4(-0{,}5)(1{,}5-a)}}{2(-0{,}5)}$ ✓ $D = 4^2 + 2(1{,}5-a)$ ✓

$= 4 + 3 - 2a = 7 - 2a$ ✓

16 19-2a

eine Lsg, falls $D = 0$ ✓ $7 - 2a = 0$ ~~$a = 3{,}5$~~ ✓ $\boxed{a = 9{,}5}$

$x_{1,2} = \frac{4}{-1} = -4$ ✓ ④ ~~$B(-2/3{,}5)$~~ ✓ $(4\ -2{,}5)$ 5

3.1 $f(x) = ax^2 + bx + c$

I $f(0) = 0 \Rightarrow c = 0$ ✓

II $f(4) = 0 \Rightarrow 16a + 4b = 0$ ✓

III $f(-1) = 2{,}5 \Rightarrow a - b = 2{,}5$ ✓ $|\cdot 4$

II' $16a + 4b = 0$

III' $4a - 4b = 10$ ✓

II' + III' $20a = 10$ ✓ $a = 0{,}5$ ✓ $\Rightarrow b = -2$ ✓

gesuchte Funktion $f(x) = 0{,}5x^2 - 2x$ ✓ 5

3.2 $f(x) = a(x - x_S)^2 + y_S$

$= a(x-1)^2 + 9$ S einsetzen ✓

P einsetzen ✓

$2 = a(-1-1)^2 + 9$

$2 = 4a + 9 \Rightarrow -7 = 4a \quad a = -\frac{7}{4}$ ✓

gesuchte Fkt: $f(x) = -\frac{7}{4}(x-1)^2 + 9$

$= -\frac{7}{4}(x^2 - 2x + 1) + 9$ ✓

$= -\frac{7}{4}x^2 + \frac{7}{2}x - \frac{7}{4} + 9$

$= -1\frac{3}{4}x^2 + 3{,}5x + 7\frac{1}{4}$ ✓ 4

$\frac{7}{4} = 1{,}75$

Σ 36