Lösung

1) LFF: $y = a(x+1)(x-2)$ ✓ ; $P(0|-1,5)$

$-1,5 = a(0+1)(x-2)$ ✓

$-1,5 = -2a \Rightarrow a = 3/4$ ✓

$\Rightarrow y = \frac{3}{4}(x+1)(x-2)$ ✓ 5P

$x_s = \frac{2-1}{2} = \frac{1}{2}$ ✓ $y_s = \frac{3}{4} \cdot 1\frac{1}{2} \cdot (-\frac{1}{2}) = -\frac{27}{16}$ ✓ $(\approx -1,7)$

2) $y = ax^2 + bx + c$

A: $-\frac{3}{2} = a + b + c$ ✓ $\Rightarrow a + b = +\frac{3}{2} \quad | \cdot 3$ ✓

B: $-\frac{3}{2} = 9a + 3b + c$ ✓ $\Rightarrow 9a + 3b = +\frac{3}{2}$ ✓

C: $-3 = c$ ✓

$$\begin{array}{rcl} 3a + 3b & = & +9/2 \quad | - \\ 9a + 3b & = & +3/2 \\ \hline -6a & = & +3 \end{array}$$

✓ $\Rightarrow a = -\frac{1}{2}$ ✓

$-\frac{1}{2} + b = \frac{3}{2} \Rightarrow b = 2$ ✓ $\Rightarrow y = -\frac{1}{2}x^2 + 2x - 3$ ✓ 6P

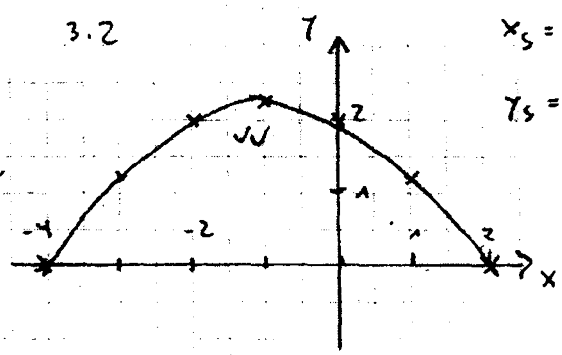
3.1) $-\frac{1}{4}x^2 - \frac{1}{2}x + 2 = 0$ ✓

$D = (-\frac{1}{2})^2 - 4 \cdot (-\frac{1}{4}) \cdot 2 = 2\frac{1}{4}$ ✓

$x_{1,2} = \frac{1/2 \pm 3/2}{-1/2}$ ✓ $\Rightarrow \underline{x_1 = -4}$, $\underline{x_2 = 2}$ ✓

3P

3.2



$x_s = \frac{1/2}{2 \cdot (-1/4)} = -1$ ✓

$y_s = 2\,1/4$ ✓

4P

3.3) $-\frac{1}{4}x^2 - \frac{1}{2}x + 2 = -\frac{1}{2}x + t$ ✓

$-\frac{1}{4}x^2 + 2 - t = 0$ ✓

$D = 0^2 - 4 \cdot (-\frac{1}{4}) \cdot (2-t) = 2 - t = 0$ ✓ $\Rightarrow \underline{t = 2}$ ✓ 4P

4.1 $x_s = \frac{-0,6}{-0,02} = 30\,m$ ✓ $y_s = 9m$ ✓ 2P

4.2 $2 \cdot 30m = 60m$ ✓✓

oder: $0 = -0,01x^2 + 0,6x = x(-0,01x + 0,6)$ ✓ $\Rightarrow x_1 = 0$

$-0,01x + 0,6 = 0 \Rightarrow x_2 = 60m$ ✓ 2P

2P 4.3 $f(55) = 2{,}75 > 2{,}44$ ⇒ Ball geht über das Tor ✓

4.4 $2{,}44 - 22 = 2{,}22$ ✓

$-0{,}01x^2 + 0{,}6x \leq 2{,}22$ ✓

$-0{,}01x^2 + 0{,}6x - 2{,}22 = 0$ ✓

5P $D = 0{,}6^2 - 4 \cdot (-0{,}01) \cdot (-2{,}22) = 0{,}2712$ ✓

$x_{1,2} = \dfrac{-0{,}6 \pm 0{,}52}{-0{,}02}$ ✓ ⇒ $x_1 = 4\,m$ $\underline{x_2 = 56\,m}$ ✓

⇒ Der Spieler muß 56 m vom Tor entfernt stehen