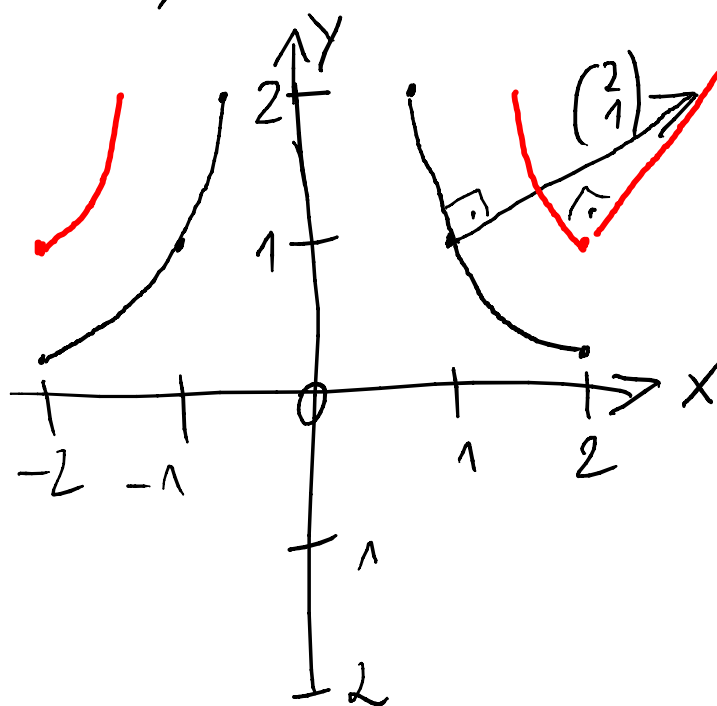


$$1) \quad x^2 y + 1 = 2$$

$$\Leftrightarrow x^2 y = 1 \Leftrightarrow x \neq 0 \wedge y = \frac{1}{x^2}$$

$$x^2 y + 1 = 5$$

$$\Leftrightarrow x^2 y = 4 \Leftrightarrow x \neq 0 \wedge y = \frac{4}{x^2}$$



— 1
— 5

$$2) \quad \frac{\partial f}{\partial x} = 2xy, \quad \frac{\partial f}{\partial y} = x^2$$

$$\frac{\partial f}{\partial x}(1;1) = 2, \quad \frac{\partial f}{\partial y}(1;1) = 1$$

$$\frac{\partial f}{\partial x}(2;1) = 4, \quad \frac{\partial f}{\partial y}(2;1) = 4$$

$$3) z = f(x_0, y_0) + \left(\frac{\partial f}{\partial x}(x_0, y_0) \right) (x - x_0) + \left(\frac{\partial f}{\partial y}(x_0, y_0) \right) (y - y_0)$$

$$= 5 + 4 \cdot (x - 2)^{2,1} + 4 \cdot (y - 1)^{0,8}$$

$$= 5 + 4 \cdot 0,1 - 4 \cdot 0,2$$

$$= 4,6 \quad \text{Wert auf Tangential-ebene} = \text{lineare Näherung}$$

Exakter Funktionswert:

$$f(2,1; 0,8) = 2,1^2 \cdot 0,8 + 1 = 4,528$$

(Taschenrechner)