

19.1

$$S := (A; \mathbf{i}, \mathbf{j}), S' := (A'; \mathbf{a}, \mathbf{b})$$

$$A' := A + \mathbf{i} - \mathbf{j}, \mathbf{a} := \frac{\sqrt{2}}{2}\mathbf{i} + \frac{\sqrt{2}}{2}\mathbf{j}, \mathbf{b} := \frac{\sqrt{2}}{2}\mathbf{i} - \frac{\sqrt{2}}{2}\mathbf{j}$$

$$P : x'^2 - 2 \cdot y' = 0$$

$$P_{|S'} = \begin{pmatrix} x' \\ y' \end{pmatrix}, P_{|S} = A' + x' \cdot \mathbf{a} + y' \cdot \mathbf{b}$$

$$= A + (\mathbf{i} - \mathbf{j}) + x' \cdot \left(\frac{\sqrt{2}}{2}\mathbf{i} + \frac{\sqrt{2}}{2}\mathbf{j} \right) + y' \cdot \left(\frac{\sqrt{2}}{2}\mathbf{i} - \frac{\sqrt{2}}{2}\mathbf{j} \right)$$

$$= A + \left(1 + \frac{\sqrt{2}}{2}x' + \frac{\sqrt{2}}{2}y' \right) \cdot \mathbf{i} + \left(-1 + \frac{\sqrt{2}}{2}x' - \frac{\sqrt{2}}{2}y' \right) \cdot \mathbf{j}$$

$$P_{|S} = \begin{pmatrix} 1 + \frac{\sqrt{2}}{2}x' + \frac{\sqrt{2}}{2}y' \\ -1 + \frac{\sqrt{2}}{2}x' - \frac{\sqrt{2}}{2}y' \end{pmatrix} = \begin{pmatrix} 1 \\ -1 \end{pmatrix} + \begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix} \cdot \begin{pmatrix} x' \\ y' \end{pmatrix}$$

$$\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 1 \\ -1 \end{pmatrix} + \begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix} \cdot \begin{pmatrix} x' \\ y' \end{pmatrix}$$

$$\begin{pmatrix} x' \\ y' \end{pmatrix} = \begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix} \cdot \begin{pmatrix} x - 1 \\ y + 1 \end{pmatrix}$$

$$P : \left(\frac{\sqrt{2}}{2}(x - 1) + \frac{\sqrt{2}}{2}(y + 1) \right)^2 - 2 \cdot \left(\frac{\sqrt{2}}{2}(x - 1) - \frac{\sqrt{2}}{2}(y + 1) \right) = 0$$

$$\left(\frac{\sqrt{2}}{2}x - \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}y + \frac{\sqrt{2}}{2} \right)^2 - 2 \cdot \left(\frac{\sqrt{2}}{2}x - \frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}y - \frac{\sqrt{2}}{2} \right) = 0$$

$$\frac{1}{2}x^2 + \frac{1}{2}y^2 + xy - \sqrt{2}x + \sqrt{2}y + 2\sqrt{2}$$

19.2

siehe gesondertes Blatt

19.3

$\mathbb{M}(2, 9, 3)$:

$$-54 \Rightarrow -0.110110000 (+110)$$

$$4522 \Rightarrow +0.111111111 (+111)$$

$$\frac{8}{7} \Rightarrow +0.100100100 (+001)$$

$$+0.110100001 (+011) \Rightarrow 6.515625$$

$$-0.100110011 (+101) \Rightarrow -19.1875$$

$$-0.100000000 (-001) \Rightarrow 0.25$$

19.4

$$x \in [1.45, 1.55], y \in [-0.005, 0.005], u \in [0.95, 1.05], v \in [-2.05, -1.95]$$

$$z := \frac{x + y}{u \cdot v} = \frac{[1.445, 1.555]}{[-2.1525, -1.8525]} = \left[-\frac{622}{741}, -\frac{578}{861} \right] \approx [-0.839406, -0.671313]$$