Quiz 2 *MAT 587, Fall 04, Sieben* Name:

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1. Let $A = \{n \in \mathbf{Z} \mid n \text{ is even }\}$, $B = \{n \in A \mid n \notin A\}$ and $C = \{1, \ldots, 10\}$. Which of the following are true?
   a. $A \ni 2$;
   b. $A \cup B = \mathbf{Z}$;
   c. $A \cap B = A$;
   d. $C \subset B$;
   e. $\forall x \in A, \exists y \in B$ such that $x = \frac{y}{2}$.

2. Let $f : \mathbf{R} \to \mathbf{R}$, $f(x) = \sqrt{x-1}$. Find $\mathrm{dom}\,(f)$.

3. Plot the graph of f if
$$f(x) = \begin{cases} \sin(x) & \text{if } x < \pi \\ \tan(x) & \text{if } \pi \leq x \leq 2\pi \\ \cos(x) & \text{if } 2\pi < x \end{cases} .$$

4. Find $\begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix} \cdot \begin{pmatrix} x_1 \\ x_2 \end{pmatrix}$.

5. Define $f(x) = e^{\sin(x+1)} + k\cos(x)$ for all $k \in$. Compute
$$\sum_{k=1}^{3} \int_1^{2k} f(x)dx.$$