

**Quiz 2**

Mat 587, Fall 16, Sieben

Name:

1. Let  $A = \{n \in \mathbb{Z} \mid n \text{ is even}\}$ ,  $B = \{n \in A \mid n \notin [10, \infty)\}$  and  $C = \{1, \dots, 10\}$ . Which of the following are true?

- a.  $A \ni 2$ ;
- b.  $A \cup B = \mathbb{Z}$ ;
- c.  $A \cap B = A$ ;
- d.  $C \subseteq B$ ;
- e.  $(\forall x \in A) (\exists y \in B)$  such that  $x = \frac{y}{2}$ .

2. Let  $f : \mathbb{R} \rightarrow \mathbb{R}$  be defined by  $f(x) = \sqrt{x-1}$ . Find  $\text{dom}(g \circ f)$  if  $g$  is given by the table:

$x$	1	2	3	4	5
$g(x)$	10	11	-3	5	0

3. Plot the graph of  $f$  if

$$f(x) = \begin{cases} \sin(x), & x < \pi \\ \tan(x), & \pi \leq x \leq 2\pi \\ \cos(x), & 2\pi < x < \rho. \end{cases}$$

4. Find

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

5. Define  $f(x) = e^{\sin(x+1)} + k \cos(x)$  for all  $k \in \mathbb{N}$ . Compute

$$\sum_{k=1}^3 \int_1^{2k} f(x) dx.$$