

# CSCI 271

## Homework 4

Peter Danenberg  $\langle$ peterchd@usc.edu $\rangle$

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- $\{0, 1, 3\}$
  - $\{0, 1, 3, 5, 8\}$
  - $\{0, 8, 16, 40\}$
- No;  $g$ 's range is independent of  $f \circ g$ 's transformation of it.
- $f = \{S = \{1\} \rightarrow a, T = \{0\} \rightarrow a\}$
- $\{x | 0 \leq x < 1\}$
  - $\{x | -1 \leq x < 2\}$
  - $\{\emptyset\}$
- $\lceil b \rceil - \lfloor a \rfloor - 1$
- $y = \sqrt[3]{x-1}$

7.

|     | Symmetric    | Reflexive    | Antisymmetric | Transitive   |
|-----|--------------|--------------|---------------|--------------|
| $a$ | $\times$     | $\checkmark$ | $\times$      | $\times$     |
| $b$ | $\checkmark$ | $\checkmark$ | $\times$      | $\checkmark$ |
| $c$ | $\checkmark$ | $\checkmark$ | $\times$      | $\checkmark$ |
| $d$ | $\times$     | $\times$     | $\checkmark$  | $\times$     |
| $e$ | $\times$     | $\checkmark$ | $\times$      | $\times$     |
| $f$ | $\times$     | $\checkmark$ | $\checkmark$  | $\checkmark$ |
| $g$ | $\times$     | $\checkmark$ | $\times$      | $\times$     |

8. (Cruz, ..., 335, ...), (Cruz, ..., 412, ...), (Farber, ..., 501, ...), (Farber, ..., 617, ...)

9.

|          | Reflexive | Irreflexive | Symmetric | Antisymmetric | Transitive |
|----------|-----------|-------------|-----------|---------------|------------|
| <i>a</i> | ×         | ×           | ✓         | ×             | ×          |
| <i>b</i> | ✓         | ×           | ×         | ✓             | ×          |
| <i>c</i> | ×         | ✓           | ✓         | ×             | ×          |