

# Math 2283 - Introduction to Logic

Quiz #21 - 2016.03.07

Name: \_\_\_\_\_

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For this quiz, let the universal set  $U$  be the set of natural numbers, that is,  $U = \{1, 2, 3, \dots\}$ . Furthermore, define the following relations  $G$ ,  $N$ , and  $T$  as follows:

$xGy \stackrel{\text{def}}{\iff} x$  and  $y$  have no common factors greater than 1

$xNy \stackrel{\text{def}}{\iff} x$  and  $y$  have exactly one common factor greater than 1

$xTy \stackrel{\text{def}}{\iff} x$  and  $y$  have at least one common factor greater than 1

1. Which of the above relations are reflexive?
  
  
  
  
  
  
  
  
  
  
2. Which of the above relations are symmetrical?
  
  
  
  
  
  
  
  
  
  
3. Which of the above relations are transitive?
  
  
  
  
  
  
  
  
  
  
4. Is  $G' = T$ ?
  
  
  
  
  
  
  
  
  
  
5. Is  $N \subseteq T$ ?