

Math 301
Quiz 2
Fall 2007

Justify all answers with neat and organized work. Clearly indicate your answers.
20 points possible.

1. (4 pts.) A Data-Smell ID number is an eleven digit number. Any of the digits may be 0.

(a) How many Data-Smell ID numbers are possible with all of their digits odd?

(b) How many Data-Smell ID numbers are possible that read the same backward and forward (e.g., 12207670221)?

2. (4 pts.) Find the cardinality of each set.

(a) $\{\{1, 2, 3\}, \{3, 4, 5\}\}$

(b) $\{x \in 2^{\{6,7,8,9\}} : |x| = 3\}$

3. (4 pts.) Let $A = \{1, 2, 3\}$ and $B = \{3, 4\}$. Compute each of these.

(a) $A - B$

(b) $A \times B$

4. (4 pts.) For each of the following sentences, write the negation of the sentence (and “move” the negation as far to the right as possible).

(a) $\forall x \in \mathbb{Z}, x > 0$

(b) $\forall x \in \mathbb{Z}, \exists y \in \mathbb{Z}$ such that $x = y$

5. (4 pts.) Let $C = \{x \in \mathbb{Z} : 6 \mid x\}$ and $D = \{x \in \mathbb{Z} : 3 \mid x\}$. Prove that $C \subseteq D$.