

MATH 243 – Mathematical Structures  
Quiz 2 – September 15, 2017

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

*Directions*

Do all work and answer all questions on this sheet. There are 30 possible points, distributed as indicated. Notation:  $\mathbf{Z}$  is the set of all integers (positive and negative).

A) Suppose  $A = \{4, 5, 6, 7, 8, 9, 10, 11, 12\}$ ,  $B = 3\mathbf{Z}$ , and  $C = \{n \in \mathbf{Z} \mid n = k^2 \text{ for some } k \in \mathbf{Z}\}$ .

(1) (5) What is the set  $A \cap C$ ?

(2) (5) What is the set  $A \cap (B \cup C)$ ?

(3) (5) What is the set  $(A \cap B) \cup (A \cap C)$ ?

B) (15) Is  $15\mathbf{Z} \subseteq (3\mathbf{Z} \cap 5\mathbf{Z})$ ? Prove your assertion.