

**Set Theory**  
**Quiz 6**

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

You have 10 minutes to complete this quiz. If you have a question raise your hand and remain seated. In order to receive full credit your answer must be **complete**, **legible** and **correct**. Show your work, and give adequate explanations.

1. Let  $\lambda$  and  $\kappa$  be infinite cardinal numbers. Explain why  $\lambda \cdot \kappa = \kappa \cdot \lambda$ .

Choose sets  $A, B$  with  $|A| = \lambda$  and  $|B| = \kappa$ . Then  $\lambda \cdot \kappa = |A \times B|$  and  $\kappa \cdot \lambda = |B \times A|$ . Since  $f : A \times B \rightarrow B \times A : (a, b) \mapsto (b, a)$  is a bijection, we obtain the middle inequality in:

$$\lambda \cdot \kappa = |A \times B| = |B \times A| = \kappa \cdot \lambda.$$