## DEPARTMENT OF MATHEMATICS

MATHS 255 Collaborative Tutorial 1 March 16, 2005

1. Let U be a universal set and let A, B be subsets of U. Show that

$$(A \cap B)_U^C = A_U^C \cup B_U^C.$$

**2.** Let A, B and C be sets. Show that

$$A \times (B \setminus C) = (A \times B) \setminus (A \times C).$$

**3.** Let A and B be sets. Show that

$$(A \times B) \cap (B \times A) = \emptyset \iff A \cap B = \emptyset.$$

**4.** Let A, B and C be sets. If  $A \cap B = A \cap C$  and  $A \cup B = A \cup C$ , then show that B = C.