MTH 3318 - Test #3

FALL 2023

Pat Rossi Name _____

Instructions. Show your work completely. Document your work well.

Remark 1 *For problems 1 - 3, prove one.*

1. $A \cap B = A \Rightarrow A \subseteq B$
2. $(A \cup B) = B \Rightarrow A \subseteq B$
3. $A \subseteq B \Rightarrow B^c \subseteq A^c$

Remark 2 *For problems 4 - 6, prove one.*

4. $(A \cap B)^c = A^c \cup B^c$
5. $A \subseteq B \Rightarrow (A \cap B) = A$
6. $(A \cup B)^c = A^c \cap B^c$

Remark 3 *Prove problem 7.*

7. $A \cap B = \emptyset \Leftrightarrow (B \cap A^c) = B$

Remark 4 *For problems 8 - 9, prove either one by contradiction.*

8. $(A \cap B) \subseteq A$
9. $(A \cap B) = \emptyset \Rightarrow A \subseteq B^c$

Remark 5 *For problems 10 - 11, prove either one, by proving the contrapositive.*

10. $A \subseteq B \Rightarrow (A \cap B) = A$
11. $(A \cup B) = B \Rightarrow A \subseteq B$

Remark 6 *Disprove problem 12 by providing a counter-example.*

12. $(A \cup B)^c = A^c \cup B^c$