

Math 2534 Homework 9 Spring 2018 Show all work and staple multiple sheets.

Problem 1: Use set containment to derive a conclusion from the following statements
(A Lewis Carroll puzzle)

No one takes in the Times, unless he is well educated.

No hedgehogs can read.

Those who cannot read are not well educated.

Problem 2:

If $A \times B = \{(a,b), (b,b), (c,b), (a,a), (b,a), (c,a)\}$ then find the elements in each A and B.

Problem 3: Find the power set for :

a) $B = \{a, b, c, d\}$

b) $A = \{\emptyset, \{\emptyset\}\}$

Problem 4: Given sets $A = \{a, b, \{c\}, c\}$, $B = \{a, \{b, c\}, d, \emptyset\}$, $C = \{b, c\}$

Find the following: (don't forget to use equal signs.)

a) Find the following sets:

1) $A \cap B$

2) $B \cup C$

3) $B - A$

4) $B \cap C$

5) $A - C$

Problem 5: Draw a Venn diagram for each of the following sets.

a) $A - (B \cap C)^c$

b) $(A^c \cap B) \cup C$

Problem 6: Using proof by elements, prove the following:

Theorem 1: For all sets A, B, C, D, if $A \subseteq C$ and $B \subseteq D$, then $A \cap B \subseteq C \cap D$

Theorem 2: For all sets A, B, If $(A \cup B)^c = A^c \cap B^c$

Theorem 3: For all sets A, B, If $A \subseteq B$ Then $A \cap B^c = \emptyset$ (Use proof by contradiction.)

Problem 7: Prove using Set Algebra:

For all sets A, B, $[A - (B \cap A^c)]^c \cap B = B - A$