

MTH 1101 — QUIZ 4 — FALL 1996

Instructions: Put your name in the blanks above. Put your final answers to each question in the designated spaces on these test pages. Show your work—if there is not enough room, use the back of the page.

1) List the elements in set S , where S is defined by:

1 point each

a) $S = \{x \mid x \text{ is an even integer between } -3 \text{ and } 3\} =$

b) $S = \{x \mid x \text{ is a letter in the word "northeastern"}\} =$

2) Let $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, $A = \{1, 2, 3, 4\}$, $B = \{1, 5, 6\}$, $C = \{2, 5, 8\}$.

a) Find each of the following:

1 point each

i) $A^c =$

ii) $B \cap C =$

iii) $B \cap C^c =$

iv) $A \cup B^c =$

v) $(A \cup C) \cap B =$

vi) $(\emptyset \cap A) \cap B =$

vii) $(\emptyset \cup A) \cap B =$

b) Determine whether each of the following is true or false:

1 point each

i) $4 \in B$

ii) $4 \notin C$

iii) $A \subseteq B$

iv) $B \subseteq U$

v) $\emptyset \subseteq A$

vi) $A \not\subseteq \emptyset$

3) In a pollution study of 200 rivers: 58 were polluted by sulphates, 35 were polluted by phosphates, 48 were polluted by crude oil, 21 were polluted by both sulphates and phosphates, 15 were polluted by both sulphates and crude oil, 12 were polluted by both phosphates and crude oil, and 8 were polluted by all three.

a) Draw a Venn diagram with this information.

4 points

b) How many rivers were polluted by

1 point each

i) at least two of these impurities?

ii) exactly one of these impurities?

iii) none of these impurities?

4) The Sox and the Yanks are to play a best-of-three series.

a) Draw a tree diagram showing all the possible series.

4 points

b) List all the possible series.

2 points

c) The number of possible 2-game series is: _____.

2 points

The number of possible 3-game series is: _____.