

1. For this entire problem, let the universal set  $U = \{x \mid x \text{ is a whole number between } 2\frac{1}{2} \text{ and } 10\frac{1}{2}\}$  be the universal set. Let  $A = \{x \mid x \in U \text{ and } x \text{ is odd}\}$ ,  $B = \{3, 6, 9\}$ ,  $C = \{8, 10\}$ , and  $D = \{4, 9, 10\}$ . Find the following sets, using correct notation.

(a)  $(A \cup C) \cap D$

(b)  $(C \cap D) \cup B$

(c)  $(D \cup B)^c$

(d)  $A \setminus B$

(e)  $C \setminus D$

(f)  $(B \setminus A) \cup D^c$

(g)  $D \times C$

(h)  $C \times A^c$

continue on back, if time permits

2. Consider the lists of conditions below. For each, IF POSSIBLE, make up sets having the indicated qualities, and confirm by performing the operation involved. IF NOT POSSIBLE, explain why in 1-2 sentences. Be prepared to share your responses with the class.

(a) Make up sets  $A$  and  $B$  for which  $4 \in A$ ,  $n(B) = 6$ , and  $A \cap B = \{2\}$ .

(b) Make up sets  $K$  and  $L$  with  $n(K) = 5$ ,  $3 \in L$ , and  $n(K \cup L) = 4$ .

(c) Let  $X = \{5, 6, 7\}$ . Make up a set  $K$  having  $n(K \setminus X) = 3$ .

(d) Again let  $X = \{5, 6, 7\}$ . Make up a set  $J$  for which  $3 \in X \setminus J$ .

(e) Make up sets  $M$  and  $P$  for which  $(\Delta, *) \in M \times P$ ,  $(\Delta, 2) \in M \times P$ , and  $n(M \times P) = 6$ .