

**MATH 201      HW 7**

due **Mar 4** before class.

**Staple** all your papers. Write carefully, unreadable answers will not receive any credit.

Please write your section or time of your class on you HW.

**1:** 8 [12] Use methods from chapter 8 to show:

If  $A, B$  and  $C$  are sets, then  $A - (B \cap C) = (A - B) \cup (A - C)$ .

*That means drawing Venn's diagram is NOT an acceptable solution.*

**2:** 8 [16] Use methods from chapter 8 to show:

If  $A, B$  and  $C$  are sets, then  $A \times (B \cup C) = (A \times B) \cup (A \times C)$ ..

*That means drawing Venn's diagram is NOT an acceptable solution.*

**3:** 8 [20] Prove that  $\{9^n : n \in \mathbb{Q}\} = \{3^n : n \in \mathbb{Q}\}$ .

**4:** 9 [12] Prove or disprove the following statement:

If  $a, b, c \in \mathbb{N}$  and  $ab, bc$  and  $ac$  all have the same parity, then  $a, b$  and  $c$  all have the same parity.

**5:** 9 [16] Prove or disprove the following statement:

If  $A$  and  $B$  are finite sets, then  $|A \cup B| = |A| + |B|$ .

**6:** 9 [30] Prove or disprove the following statement:

There exist integers  $a$  and  $b$  for which  $42a + 7b = 1$ .

**7:** 9 [30] Prove or disprove the following statement:

Every number greater than four is equal to sum of two primes.

**8:** *Magic* Fill numbers  $1 \dots 9$  into the following  $3 \times 3$  grid such that the sum in every row, column and both diagonals is the same.

