MATH 110 – QUIZ 2 – 7 SEPTEMBER 2006

Answer all of the following questions in the space provided. Show all work as partial credit may be given. Answers without justification, even if they are correct, will earn no credit.

1. (2 pts. each) Let $U = \{\text{all Math 110 students}\}$, $S = \{\text{all senior Math 110 students}\}$, $P = \{\text{all Math 110 students who have passed the placement test}\}$, and $R = \{\text{all Math 110 students who have officially registered}\}$.

(a) Describe in set-theoretic notation the following set:

$T = \{\text{all seniors registered for Math 110 who have not passed the placement test}\}$.

$S \cap R \cap P'$

(b) Describe in words the set $P \cup R'$.

{all Math 110 students who have either passed the placement or have not registered (or both)}.

2. (3 pts.) Suppose that all of the 1000 first–year students at a certain college are enrolled in a math or an English course. Suppose that 400 are taking both math and English and 600 are taking English. How many are taking a math course? (Hint: Use the inclusion-exclusion principle.)

$M = \{\text{students taking a math course}\}$

$E = \{\text{students taking an English course}\}$

$n(M \cup E) = n(M) + n(E) - n(M \cap E)$: $1000 = n(M) + 200$

$1000 = n(M) + 600 - 400$: $n(M) = 800$ //

3. (3 pts.) Draw a two–circle Venn diagram and shade in the set $S' \cap T'$.