MA 110-02 §1.5 – 2.3	Quiz #2	score	Name: Key 19 June 2001

1. Determine if the following argument is valid (define the necessary symbols, rewrite the argument in symbolic form, and construct a truth table). *(6 points)*

> If you want to do well on the test, then you have to study for it. If you play too many hours of video games, then you won't study for the test. Therefore, if you play too many hours of video games, you won't do well on the test.
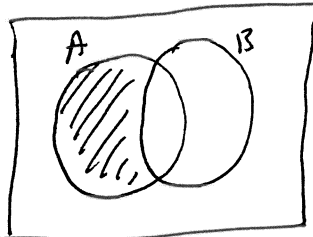
P: do well on test

q: study

r: play video

$$(p \to q) \land (r \to \sim q) \to (r \to \sim p)$$

p	q	r	① $p \to q$	② $r \to \sim q$	③ $r \to \sim p$	①∧②	①∧②→③
T	T	T	T	F	F	F	T
T	T	F	T	T	T	T	T
T	F	T	F	T	F	F	T
T	F	F	F	T	T	F	T
F	T	T	T	F	T	F	T
F	T	F	T	T	T	T	T
F	F	T	T	T	T	T	T
F	F	F	T	T	T	T	T

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2. Let $A = \{a, c, e, g, h, j, l\}$ and $B = \{a, b, c, e, m\}$. If the universal set is the first half of the alphabet $U = \{a, b, c, d, e, f, g, h, i, j, k, l, m\}$, find the set $A \cap B'$. Also, shade in a Venn diagram to illustrate the set. *(5 points)*

$$A \cap B' = \{g, h, j, l\}$$

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3. In a group of 150 students, 120 enjoy taking mathematics classes, 85 enjoy taking statistics classes, and 22 enjoy taking neither. How many enjoy taking both kinds of classes? *(5 points)*

$$n(M \cup S) = n(M) + n(S) - n(M \cap S) \Rightarrow 128 = 120 + 85 - n(M \cap S)$$

$$\Rightarrow n(M \cap S) = 77$$

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4. From 6 different shirts, 3 pairs of pants, 4 pairs of socks, and 2 pairs of shoes, how many different outfits can be formed? *(4 points)*

$$6 \cdot 3 \cdot 4 \cdot 2 = 144$$