Name:

Quiz 6: §7.4, 7.5

Complete the following problems to the best of your ability. **SHOW ALL OF YOUR WORK.** Unshown work will not be graded. You may use a calculator.

1. [60] Suppose we're being dealt a hand of 5 cards from a standard 52-card deck.

   (a) What is the probability of being dealt two pair (two pairs of two different cards, with the fifth card not matching either pair)?

   (b) What is the probability of being dealt a flush (four cards of the same suit)?

   (c) Suppose we've been dealt the following hand:

   A♠, 10♠, J♢, 2♡, 4♠

   We get to trade two cards in for a better hand. If we trade in the jack and the two, what is the probability of us ending up with a flush?

2. [40] Suppose a survey was done of 100 different Math 170 students about their studying habits and their test grades. They were asked whether they scored a grade higher than a C, and whether they studied for at least two hours for the test. The responses were sorted into this table:

	C or lower	higher than C	total
studied at least 2hrs	24	46	70
studied less than 2 hrs	21	9	30
total	45	55	100

Suppose that A is the event that the student studied for at least 2 hours, and B is the event that the got a grade higher than a C.

(a) What does $P(A \cap B)$ mean in words? Calculate it.

(b) What does $P(B|A')$ mean in words? Calculate it.

(c) Are the events A and B independent? Prove your answer.