In Class Exercise #8: Probability: Compound Events

1. **Medical Tests**

Diagnostic tests of medical conditions can have several types of results. The test result can be positive or negative, whether or not a patient has the condition. A positive test (+) indicates the patient has the condition. A negative test (-) indicates the patient does not have the condition. Remember, a positive test does not PROVE that the patient has the condition, additional medical work may be required!

Consider the following random sample of 270 patients, some of whom have a medical condition and some of whom do ot, Results of a new diagnostic test for the condition are shown.

	Condition Present	Condition Absent	Row Total
Test Result +	72	37	109
Test Result -	82	79	161
Column Total	154	116	270

Assume the sample is representative of the entire population. For a person selected at random, compute the following probabilities. Give your answers in fractions:

(a) That the test result is positive, given the condition is present.

(b) That the test result is negative, given the condition is present.

(c) That the test result is positive, given the condition is absent.

(d) That the test result is negative, given the condition is absent.

(e) That the condition is present and the test result is positive.

(f) That the condition is present and the test result is negative.

(g) If you go to get tested, what is the probability that the test results accurately predict your condition?

2. **Deck of Cards**

   A standard deck of 52 cards contains 4 suits (heart, diamonds, clubs, spades), and each suit has 1 card of each of the 13 ranks (10 number cards, and 3 face cards: J, K, Q)

   Answer in fractions, and show your steps. When drawing a single card from the deck, what is the probability that you draw...

   (a) A heart?

   (b) A face card?

   (c) A card that is a heart and a face?

   (d) A card that is a heart or a face?

   (e) A card that is either a heart or a face, but not both?