Name _____ Date _____

AP Statistics Period _____

Probability Day 2 - HW

Questions 1–4 refer to the following study: Five hundred people used a home test for HIV, and then all underwent more conclusive hospital testing. The accuracy of the home test was evidenced in the following table.

	HIV	Healthy	
Positive test	35	25	60
Negative test	5	435	440
	40	460	

1) What is the *predictive value* of the test? That is, what is the probability that a person has HIV and tests positive?

(A) .070
(B) .130
(C) .538
(D) .583
(E) .875

2) What is the *false-positive* rate? That is, what is the probability of testing positive given that the person does not have HIV?

(A) .054
(B) .050
(C) .130
(D) .417
(E) .875

3) What is the *sensitivity* of the test? That is, what is the probability of testing positive given that the person has HIV?

(A) .070
(B) .130
(C) .538
(D) .583
(E) .875

4) What is the *specificity* of the test? That is, what is the probability of testing negative given that the person does not have HIV?

(A) .125
(B) .583
(C) .870
(D) .950
(E) .946

5) Suppose you toss a coin ten times and it comes up heads every time. Which of the following is a true statement?

(A) By the law of large numbers, the next toss is more likely to be tails than another heads.
(B) By the properties of conditional probability, the next toss is more likely to be heads given that ten tosses in a row have been heads.
(C) Coins actually do have memories, and thus what comes up on the next toss is influenced by the past tosses.
(D) The law of large numbers tells how many tosses will be necessary before the percentages of heads and tails are again in balance.
(E) The probability that the next toss will again be heads is .5.

6) Suppose the probability that you will receive an A in AP Statistics is .35, the probability that you will receive A's in both AP Statistics and AP Biology is .19, and the probability that you will receive an A in AP Statistics but not in AP Biology is .17. Which of the following is a proper conclusion?

(A) The probability that you will receive an A in AP Biology is .36.
(B) The probability that you didn't take AP Biology is .01.
(C) The probability that you will receive an A in AP Biology but not in AP Statistics is .18.
(D) The given probabilities are impossible.
(E) None of the above

7) There are two games involving flipping a coin. In the first game you win a prize if you can throw between 40% and 60% heads. In the second game you win if you can throw more than 75% heads. For each game would you rather flip the coin 50 times or 500 times?

(A) 50 times for each game
(B) 500 times for each game
(C) 50 times for the first game, and 500 for the second
(D) 500 times for the first game, and 50 for the second
(E) The outcomes of the games do not depend on the number of flips.

8) Suppose there are five outcomes to an experiment and a computer calculates the respective probabilities of the outcomes to be .4, .5, .3, 0, and – .2. The proper conclusion is that

(A) the sum of the individual probabilities is 1.
(B) one of the outcomes will never occur.
(C) one of the outcomes will occur 50% of the time.
(D) all of the above are true.
(E) there is an error in the computer program.

The following data are from *The Commissioner's Standard Ordinary Table of Mortality:*

Age	Number Surviving
0	10,000,000
20	9,664,994
40	9,241,359
70	5,592,012

9) What is the probability that a 20-year-old will survive to be 70?

(A) .407
(B) .421
(C) .559
(D) .579
(E) .966

10) You own an unusual die. Three faces are marked with the letter "X," two faces with the letter "Y," and one face with the letter "Z." What is the probability that at least one of the first two rolls is a "Y"?

(a) $\frac{1}{6}$

(b) $\frac{2}{3}$

(c) $\frac{1}{3}$

(d) $\frac{5}{9}$

(e) $\frac{2}{9}$

11) An automobile service station performs oil changes and tire replacements, as well as other services. Sixty percent of its customers request an oil change, 30 percent request tire replacements, and 10 percent request both. A customer requests an oil change. What is the probability this customer does not request tire replacements?

(A) 0.420
(B) 0.500
(C) 0.700
(D) 0.833
(E) 0.857

12) A contest is held to give away a free pizza. Contestants pick an integer at random from the integers 1 through 100. If the number chosen is divisible by 24 or by 36, the contestant wins the pizza. What is the probability that a contestant wins a pizza?