

AP Statistics
HW #36

(These problems were missing from the big free response packet)

2008 AP® STATISTICS FREE-RESPONSE QUESTIONS

3. A local arcade is hosting a tournament in which contestants play an arcade game with possible scores ranging from 0 to 20. The arcade has set up multiple game tables so that all contestants can play the game at the same time; thus contestant scores are independent. Each contestant's score will be recorded as he or she finishes, and the contestant with the highest score is the winner.

After practicing the game many times, Josephine, one of the contestants, has established the probability distribution of her scores, shown in the table below.

Josephine's Distribution				
Score	16	17	18	19
Probability	0.10	0.30	0.40	0.20

Crystal, another contestant, has also practiced many times. The probability distribution for her scores is shown in the table below.

Crystal's Distribution			
Score	17	18	19
Probability	0.45	0.40	0.15

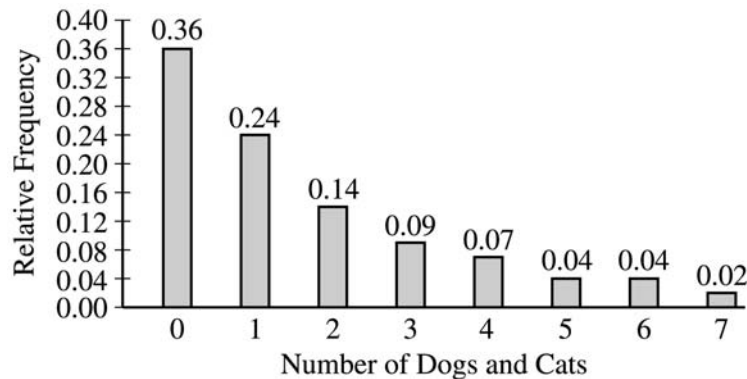
- (a) Calculate the expected score for each player.
- (b) Suppose that Josephine scores 16 and Crystal scores 17. The difference (Josephine minus Crystal) of their scores is -1 . List all combinations of possible scores for Josephine and Crystal that will produce a difference (Josephine minus Crystal) of -1 , and calculate the probability for each combination.
- (c) Find the probability that the difference (Josephine minus Crystal) in their scores is -1 .
- (d) The table below lists all the possible differences in the scores between Josephine and Crystal and some associated probabilities.

Distribution (Josephine minus Crystal)						
Difference	-3	-2	-1	0	1	2
Probability	0.015			0.325	0.260	0.090

Complete the table and calculate the probability that Crystal's score will be higher than Josephine's score.

2007 AP[®] STATISTICS FREE-RESPONSE QUESTIONS (Form B)

2. The graph below displays the relative frequency distribution for X , the total number of dogs and cats owned per household, for the households in a large suburban area. For instance, 14 percent of the households own 2 of these pets.



- (a) According to a local law, each household in this area is prohibited from owning more than 3 of these pets. If a household in this area is selected at random, what is the probability that the selected household will be in violation of this law? Show your work.
- (b) If 10 households in this area are selected at random, what is the probability that exactly 2 of them will be in violation of this law? Show your work.
- (c) The mean and standard deviation of X are 1.65 and 1.851, respectively. Suppose 150 households in this area are to be selected at random and $\bar{X}$, the mean number of dogs and cats per household, is to be computed. Describe the sampling distribution of $\bar{X}$, including its shape, center, and spread.

2009 AP[®] STATISTICS FREE-RESPONSE QUESTIONS

2. A tire manufacturer designed a new tread pattern for its all-weather tires. Repeated tests were conducted on cars of approximately the same weight traveling at 60 miles per hour. The tests showed that the new tread pattern enables the cars to stop completely in an average distance of 125 feet with a standard deviation of 6.5 feet and that the stopping distances are approximately normally distributed.
- (a) What is the 70th percentile of the distribution of stopping distances?
- (b) What is the probability that at least 2 cars out of 5 randomly selected cars in the study will stop in a distance that is greater than the distance calculated in part (a) ?
- (c) What is the probability that a randomly selected sample of 5 cars in the study will have a mean stopping distance of at least 130 feet?