

A.P. Statistics
Assignment 6-3

Remember to show your thinking through your work.

1. Grades can be converted into numbers (as in calculating a GPA) where an A=4, B=3, C=2, D=1, and F=0. For a fictional class, the grade distribution was:

X (Grade)	4	3	2	1	0
P (X)	0.2	0.25	0.3	0.1	0.15

- a. Verify that this is a legitimate probability distribution.

- b. Find the mean grade for this class.

- c. Find the standard deviation.

2. A student is selling baked goods in the halls before school as a fundraiser. She sells cinnamon rolls, donuts, and croissants. Students purchase the goods according to the probability distribution:

X (Product)	Cinnamon Roll	Donut	Croissant
P (X)	0.2	0.55	0.25

- a. If a cinnamon roll yields \$.25 profit, a donut yields \$.20 profit, and a croissant yields \$.30 profit, how much profit will be made on each customer?

- b. If there are 50 customers, how much money can we expect her to make?

3. In an experiment on the behavior of young children, each subject is placed in an area with five toys. The variable of interest X is the number of toys that the child plays with. Past experiments with many subjects have shown that the probability distribution of the number X of toys played with is as follows:

X (number of toys)	0	1	2	3	4	5
P (X)	0.03	0.16	0.30	0.23	0.17	0.11

- a. How many toys might we expect a child to play with?

- b. What is the standard deviation of the number of toys played with?

- c. Describe how you might carry out a simulation to estimate the mean number of toys played with (don't actually do the simulation, just set it up).

4. A new Firestone tire is guaranteed to last for 40,000 miles. The actual mean life of the tires is 47,000 miles with a standard deviation of 4,000 miles.

- a. What percent of the tires will last for at least 40,000 miles?

- b. What percent of the tires will NOT last for at least 40,000 miles?

- c. What is the probability that a tire will last for more than 50,000 miles?

- d. The Firestone Company wants to advertise how long some of their tires last. They decide to state how long the top 3% of their tires will last. How many miles will the top 3% of their tires last?