

PRACTICE VI

Probability

1. MLB signing bonuses for different position players with respective probabilities are given in the table below.

Bonus	Position		
	Pitcher	Infielder	Outfielder
\$2000000	0.30	0.30	0.20
\$5000000	0.10	0.05	0.05

- (a) What is the probability a given bonus was for a pitcher?

- (b) What is the expected value for a bonus?

- (c) Are position and bonus independent? Explain.

2. The weights of individual apples are approximately normally distributed with a mean of 8 ounces and a standard deviation of 0.5 ounces. The weights of individual oranges are approximately normally distributed with a mean of 6 ounces and a standard deviation of 0.4 ounces. The weights of individual pieces of fruit are independent.
- (a) What is the distribution of the total fruit weight of fruit gift boxes containing 6 randomly selected apples and 6 randomly selected oranges?
- (b) The gift boxes are advertised as containing at least 5 pounds of fruit. What is the probability that a gift box contains at least 5 pounds of fruit?
- (c) An empty gift box weighs exactly 12 ounces. What is the distribution of total weights (box plus fruit) of this gift offering?

3. Suppose that women's times for the 200-meter sprint have a roughly normal distribution with a mean of 25.2 seconds and a standard deviation of 1.2 seconds. Suppose that men's times have a roughly normal distribution with a mean of 22.8 seconds and a standard deviation of 0.9 seconds. A male and female sprinter are picked at random. Assume their times are independent.

(a) What is the probability the sum of their sprints is over 50 seconds?

(b) What is the probability that the man sprinted faster than the woman?