- 1. For each description below, identify each underlined number as a parameter or statistic. Use appropriate notation to describe each number, e.g., $\hat{p} = 0.96$.
 - (a) A 1993 survey conducted by the *Richmond Times-Dispatch* one week before election day asked voters which candidate for the state's attorney general they would vote for. <u>37%</u> of the respondents said they would vote for the Democratic candidate. On election day, <u>41%</u> actually voted for the Democratic candidate.

(b) The National Center for Health Statistics reports that the mean systolic blood pressure for males 35 to 44 years of age is <u>128</u> and the standard deviation is <u>15</u>. The medical director of a large company looks at the medical records of 72 executives in this age group and finds that the mean systolic blood pressure for these executives is <u>126.07</u>.

2. Suppose two different statistics—call them Statistic A and Statistic B—can be used to estimate the same population parameter. Statistics A has lower bias than B, but A also has high variability compared to B. On the two axes below, draw two parallel dotplots showing 8 values of each statistic that are consistent with these characteristics. Assume that the parameter value is at the arrow on the axes.

Statistic A	
	٨
Statistic B	
	∧

3. A large pet store that specializes in tropical fish has several thousand guppies. The store claims that the guppies have a mean length of 5 cm and a standard deviation of 0.5 cm. You come to the store and buy 10 randomly-selected guppies and find that the mean length of your 10 guppies is 4.8 cm. This makes you suspect that the mean fish length is not what the store says it is. To explore this further, you assume that the length of guppies is Normally distributed and use a computer to simulate 200 samples of 10 guppies from the store's claimed population. Below is a dotplot of the means from these 200 samples.



- (a) What is the population in this situation, and what population parameters have we been given?
- (b) The distribution of one sample is described in the opening paragraph. What information have we been given about this sample?
- (c) Is the dotplot above a sampling distribution? Explain.

(d) Do you think the store is being honest about the length of its guppies? Justify your answer.

Chapter 7 Solutions

Practice 7.1A

1. (a) $\hat{p} = 0.37$ is a statistic p = 0.41 is a parameter. (b) $\mu = 128$ is a parameter; $\sigma = 15$ is a parameter; $\bar{x} = 126.07$ is a statistic.2. Answers will vary, but the center of values for Statistic A should be closer to the arrow than the center of the values for Statistic B, and there should be more spread in the values for Statistic A. 3. (a) The population is all the guppies in the pet store. We've been given the population mean $\mu = 5$ cm and the population standard deviation $\sigma = 0.5$ cm. (b) The sample mean is $\bar{x} = 4.8$ cm and the sample size is n = 10. (c) No, it's merely an approximation of a sampling distribution generated by simulating 200 sample means. The actual sampling distribution includes the means from *all possible samples* of size 10 from the population are as far or farther below 5.0 as our sample was. Our sample is not sufficiently unusual to arouse suspicions about the store's claim.

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