

## 9.4.1: Distribution Needed for Hypothesis Testing (Exercises)

### ? Exercise 9.4.1.1

Which two distributions can you use for hypothesis testing for this chapter?

**Answer**

A normal distribution or a Student's  $t$ -distribution

### ? Exercise 9.4.1.2

Which distribution do you use when you are testing a population mean and the standard deviation is known? Assume sample size is large.

### ? Exercise 9.4.1.3

Which distribution do you use when the standard deviation is not known and you are testing one population mean? Assume sample size is large.

**Answer**

Use a Student's  $t$ -distribution

### ? Exercise 9.4.1.4

A population mean is 13. The sample mean is 12.8, and the sample standard deviation is two. The sample size is 20. What distribution should you use to perform a hypothesis test? Assume the underlying population is normal.

### ? Exercise 9.4.1.5

A population has a mean of 25 and a standard deviation of five. The sample mean is 24, and the sample size is 108. What distribution should you use to perform a hypothesis test?

**Answer**

a normal distribution for a single population mean

### ? Exercise 9.4.1.6

It is thought that 42% of respondents in a taste test would prefer Brand A. In a particular test of 100 people, 39% preferred Brand A. What distribution should you use to perform a hypothesis test?

### ? Exercise 9.4.1.7

You are performing a hypothesis test of a single population mean using a Student's  $t$ -distribution. What must you assume about the distribution of the data?

**Answer**

It must be approximately normally distributed.

### ? Exercise 9.4.1.8

You are performing a hypothesis test of a single population mean using a Student's  $t$ -distribution. The data are not from a simple random sample. Can you accurately perform the hypothesis test?

#### ? Exercise 9.4.1.9

You are performing a hypothesis test of a single population proportion. What must be true about the quantities of  $np$  and  $nq$ ?

##### **Answer**

They must both be greater than five.

#### ? Exercise 9.4.1.10

You are performing a hypothesis test of a single population proportion. You find out that  $np$  is less than five. What must you do to be able to perform a valid hypothesis test?

#### ? Exercise 9.4.1.11

You are performing a hypothesis test of a single population proportion. The data come from which distribution?

##### **Answer**

binomial distribution

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