CHAPTER 2 SECTION 3: GRAPHICAL DESCRIPTIVE TECHNIQUES I

TRUE/FALSE

65. A cross-classification table summarizes data from two nominal variables.

ANS: T   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

66. To describe the relationship between two nominal variables you make a scatter diagram and look for a correlation.

ANS: F   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

67. If two nominal variables are unrelated, the patterns exhibited in their corresponding bar charts should be approximately the same. If a relationship exists, then some bar charts will differ from others.

ANS: T   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

68. A cross-classification table is the same thing as two frequency distribution tables, one for each variable.

ANS: F   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

69. If the relative frequencies in the rows of a cross-classification table are similar, then the two variables shown in the table are not related.

ANS: T   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

70. If two nominal variables are unrelated, the patterns exhibited in their corresponding pie charts should be approximately the same. If a relationship exists, then some pie charts will differ from others.

ANS: T   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

71. The percentage of observations in each combination of the cross-classification table must be equal in order to show two nominal variables are not related.

ANS: F   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

72. In the following cross-classification table, gender and car ownership are related.

	Own a car	Don't own a car
Females	60	30
Males	80	40

ANS: F   PTS: 1   REF: SECTION 2.3

NAT: Analytic; Descriptive Statistics

73. In the following cross-classification table, gender and fantasy baseball participation are related.

	Participate in Fantasy Football	Don't participate in Fantasy Football
Males	75	25
Females	45	55

ANS: T   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

74. A college professor classifies his students according to their grade point average (GPA) and their gender. The resulting cross-classification table is shown below.

<div align="center">GPA</div>

Gender	Under 2.0	2.0 – 3.0	Over 3.0
Male	10	30	15
Female	15	25	35

If you made a pie chart for male GPAs and a pie chart for female GPAs, those pie charts would look the same.

ANS: F   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

MULTIPLE CHOICE

75. When studying the responses to two nominal questions, we should develop a
    a. cross-classification table.
    b. frequency distribution table.
    c. cumulative percentage distribution table.
    d. scatter diagram.

ANS: A   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

76. Which of the following techniques can be used to explore relationships between two nominal variables?
    a. Comparing the relative frequencies within a cross-classification table.
    b. Comparing pie charts, one for each column (or row).
    c. Comparing bar charts, one for each column (or row).
    d. All of these choices are true.

ANS: D   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

77. A statistics professor classifies his students according to their grade point average (GPA) and their gender. The resulting cross-classification table is shown below.

<div align="center">GPA</div>

Gender	Under 2.5	2.5 – 3.5	Over 3.5
Male	5	25	10

Female	10	20	30	

Which of the following describes the relationship between GPA and gender shown by this table?
a. A higher percentage of females have GPAs over 3.5, compared to males.
b. A lower percentage of females have GPAs over 3.5, compared to males.
c. Females and males each have the same percentage of GPAs over 3.5.
d. You cannot compare male and female GPAs because the total number in each group is not the same.

ANS: A   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

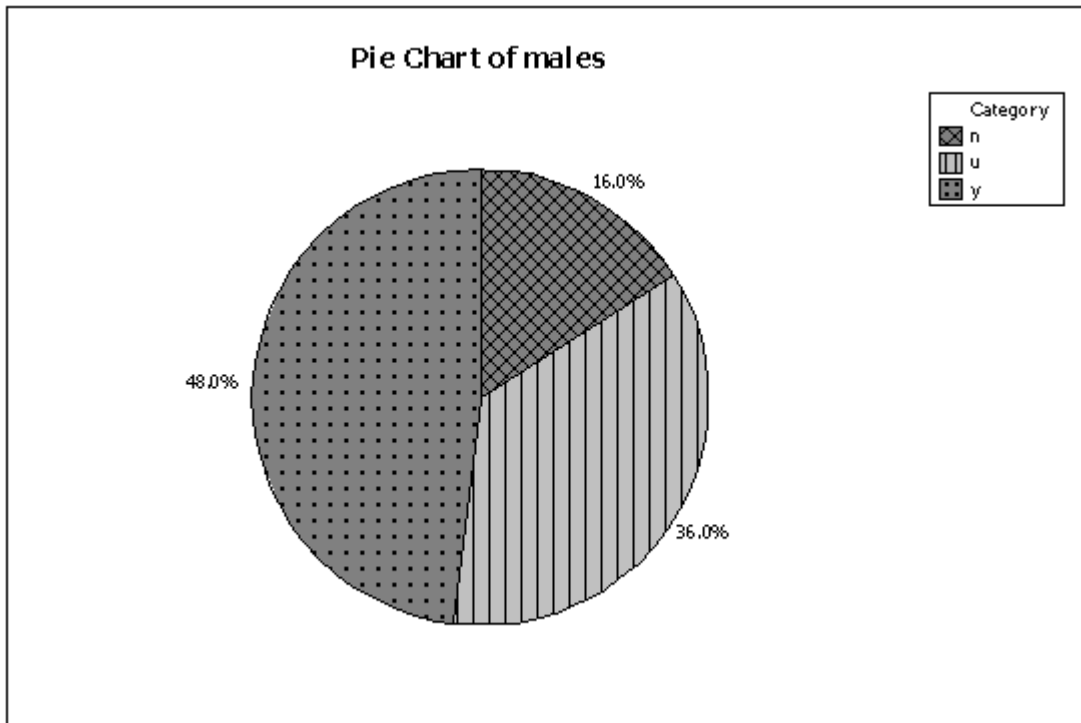78. In the following cross-classification table, how are gender and house ownership related?

	Own a house	Don't own a house
Females	60	30
Males	80	40

a. The percentage of house owners is higher for males than for females.
b. The percentage of house owners is higher for females than for males.
c. The percentage of house owners is the same for females and males.
d. You cannot compare percentages for males and females since the total frequencies are not equal.

ANS: C   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

79. Two hundred males and two hundred females were asked whether or not college baseball should have a playoff system (yes/no/undecided). Pie charts of the responses for males vs. females are shown below. Which of the following describes the relationship between gender and opinion?


Pie Chart of females

Category
n
u
y

28.0%
48.0%
24.0%

Pie Chart of males

Category
n
u
y

16.0%
48.0%
36.0%
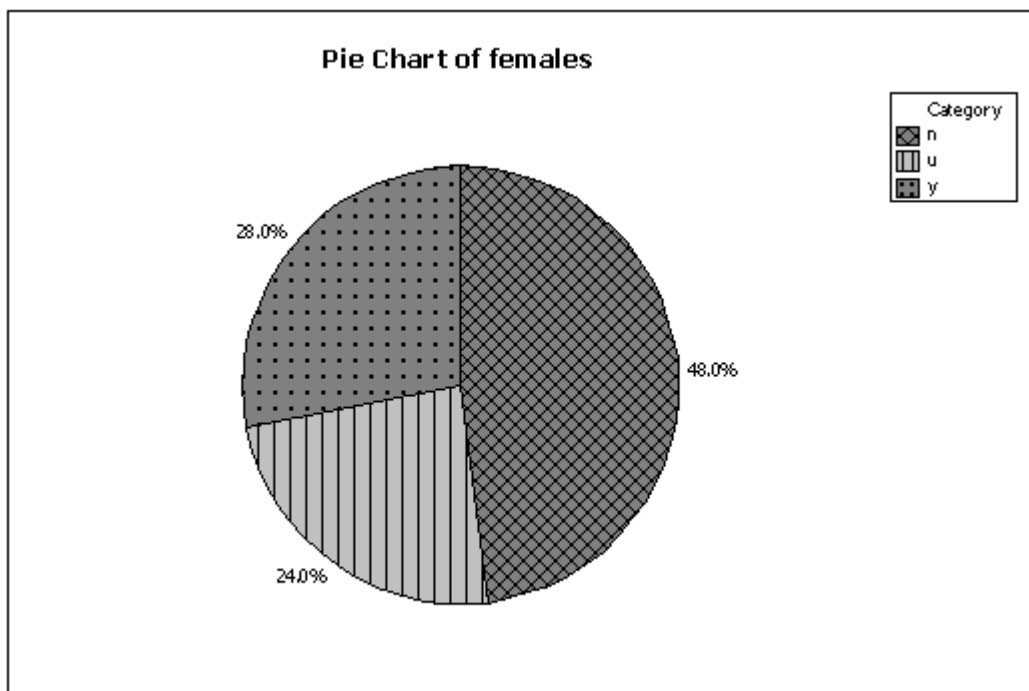
a. A higher percentage of males want a playoff system compared to females.
b. More males than females are undecided on this issue.
c. Gender and opinion on a playoff system are related.
d. All of these choices are true.

ANS: D   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

80. A survey of 100 adults was conducted to see if gender is related to pet ownership. The results are summarized in the bar chart below. Which of the following statements describes the relationship?

Percent within levels of gender.
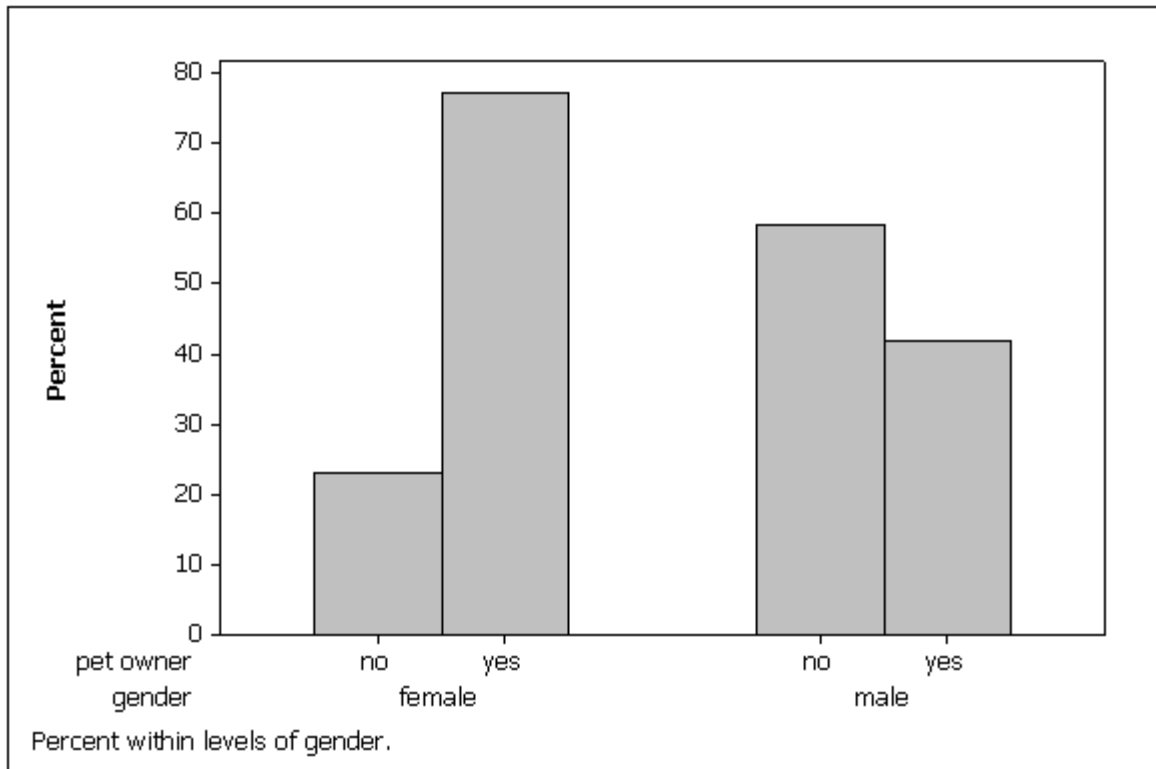
 a. Pet ownership and gender are not related.
 b. More females own pets than don't own pets.
 c. Fewer males own pets than don't own pets.
 d. None of these choices.

ANS: D   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

81. The bar charts below summarize data collected on 100 adults regarding gender and pet ownership. Which of the following statements is (are) true based on this chart?

Percent within levels of gender.
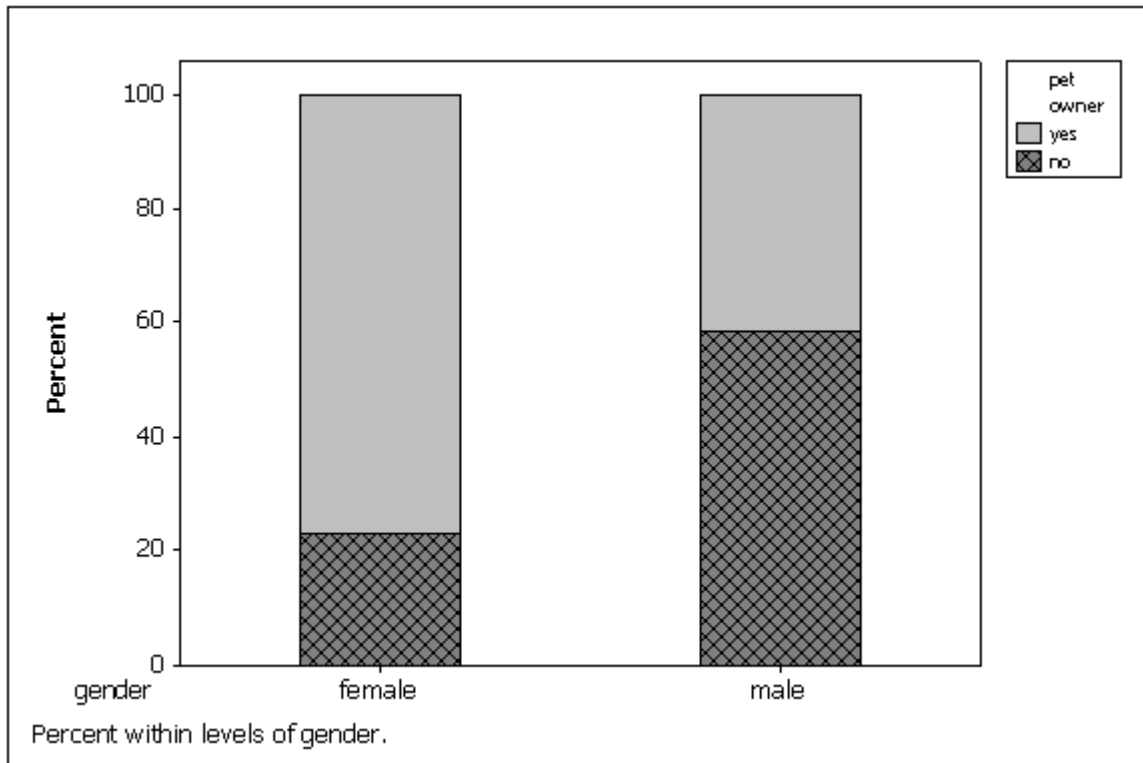
a. Gender and pet ownership are related; a higher percentage of males own pets than females.
b. Gender and pet ownership are related; a higher percentage of females own pets than males.
c. Gender and pet ownership are related; males and females own the same percentage of pets.
d. Gender and pet ownership are not related.

ANS: B   PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

COMPLETION

82. To evaluate two nominal variables at the same time, a(n) _____ table should be created from the data.

ANS:
cross-classification
cross-tabulation
contingency

PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

83. Data that contains information on two variables is called _____ data.

ANS: bivariate

PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

84. A cross-classification table is used to describe the relationship between two _____ variables.

ANS:
nominal
categorical
qualitative

PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

85. Data that contains information on a single variable is called _____ data.

ANS: univariate

PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

86. You can graph the relationship between two nominal variables using two _____ or two _____.

ANS:
bar charts, pie charts
pie charts, bar charts

PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

87. If two pie charts made from the rows of a cross-classification table look the same, then the two nominal variables _____ (are/are not) related.

ANS: are not

PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

88. If two bar charts made from the rows of a cross-classification table look the same, then the two nominal variables _____ (are/are not) related.

ANS: are not

PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

SHORT ANSWER

NARRBEGIN: All-Nighters
All-Nighters

A sample of 400 students at a certain university was taken after the midterm; 200 students reported staying up all night before the midterm and the other 200 students did not. Researchers recorded whether each student did well or poorly on the midterm. The following table contains the results.

	Did Well on Midterm	Did Poorly on Midterm

Stayed up all night	60	140
Did not stay up all night	120	80

NARREND

89. {All-Nighter Narrative} Of those who stayed up all night before the midterm, what percentage did well on the midterm?

ANS:
$60/200 = 30\%$

PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

90. {All-Nighters Narrative} Of those who did well on the midterm, what percentage stayed up all night before the midterm?

ANS:
$60/180 = 33.3\%$

PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

91. {All-Nighters Narrative} Briefly explain (using percentages) whether staying up all night before this midterm is related to a student doing poorly.

ANS:
Yes, they are related. Of those staying up all night, $140/200 = 70\%$ did poorly. Of those who didn't stay up all night, $80/200 = 40\%$ did poorly. Staying up all night before this midterm is associated with lower performance.

PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

92. {All-Nighters Narrative} There is a relationship between whether or not a student stayed up all night before the midterm, and how well they did on the midterm. Describe this relationship using percentages.

ANS:
Of those who stayed up all night, $60/200 = 30\%$ did well and 70% did not. Of those who didn't stay up all night, $120/200 = 60\%$ did well and 40% did not.
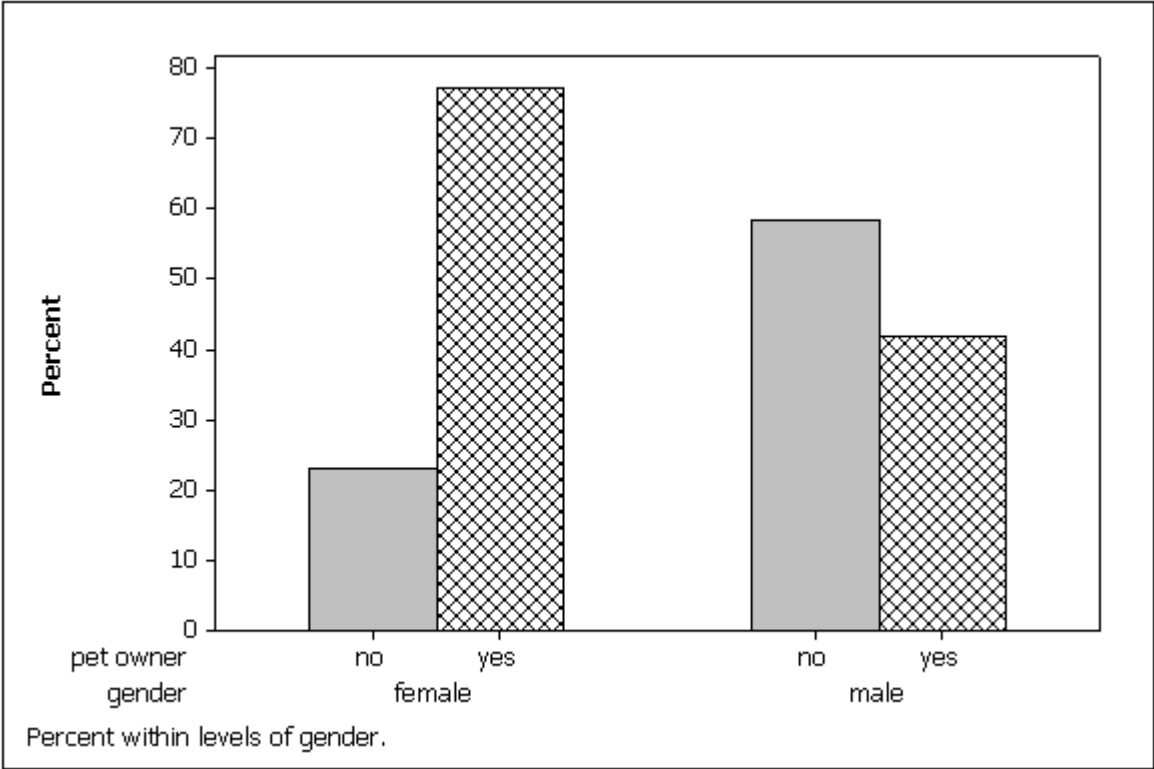
PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics

93. Using the following cross-classification table, draw two bar charts that compare pet ownership for males vs. females. Are gender and pet ownership related?
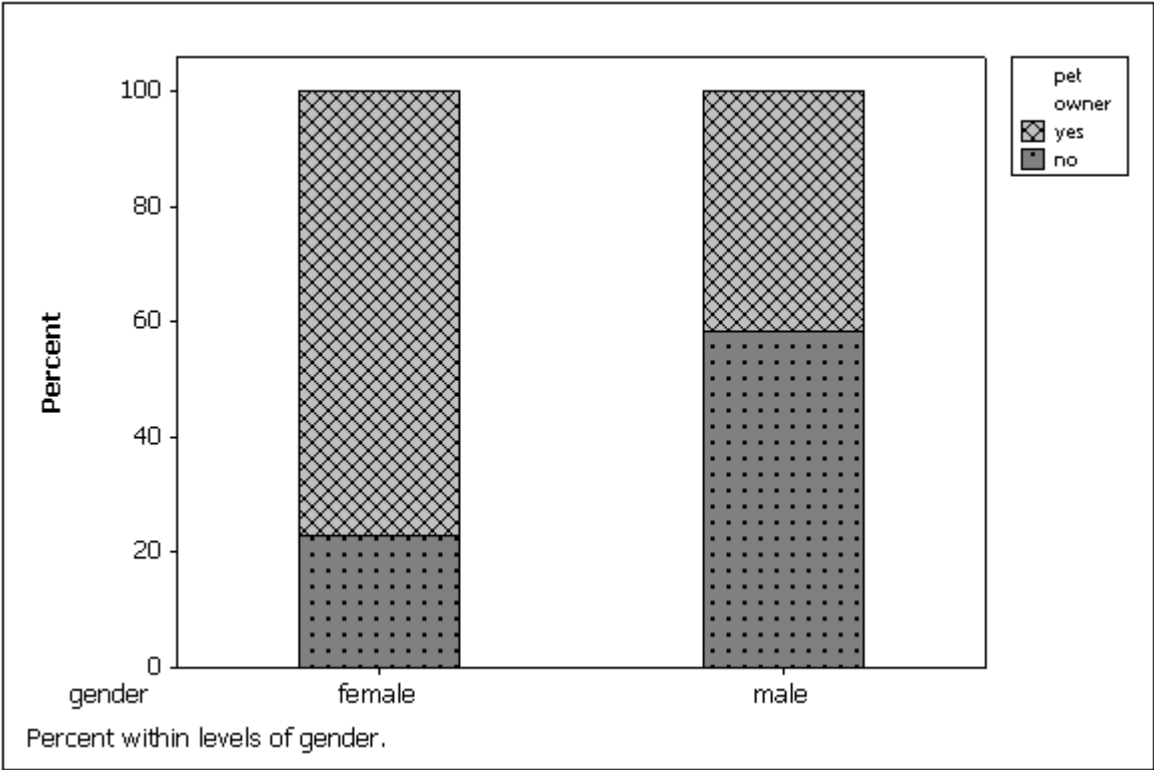
	Own a pet	Don't own a pet
Females	75	25
Males	40	60

ANS:

The first "side-by-side" bar chart below shows gender and pet ownership are related. More females own pets than males (75% vs. 40%.) Note the bar charts could be stacked also, and show the same results; see the second "stacked" bar chart below.
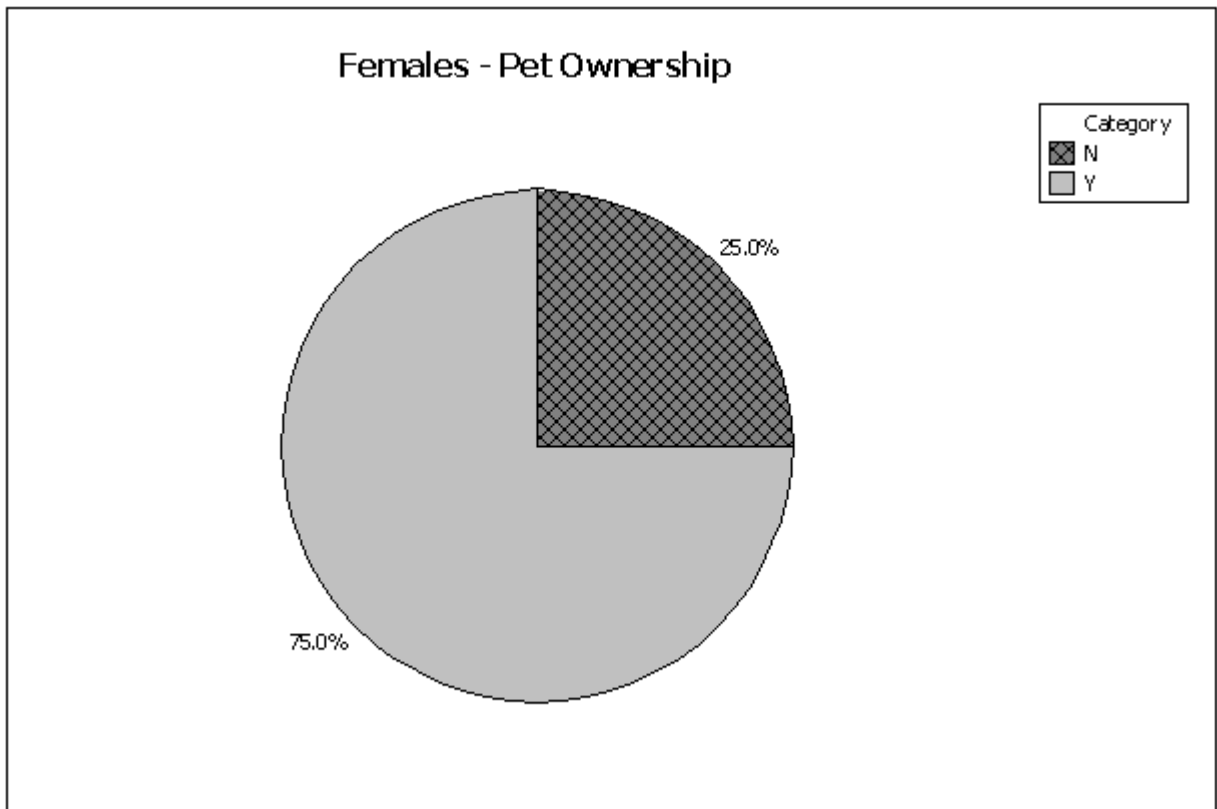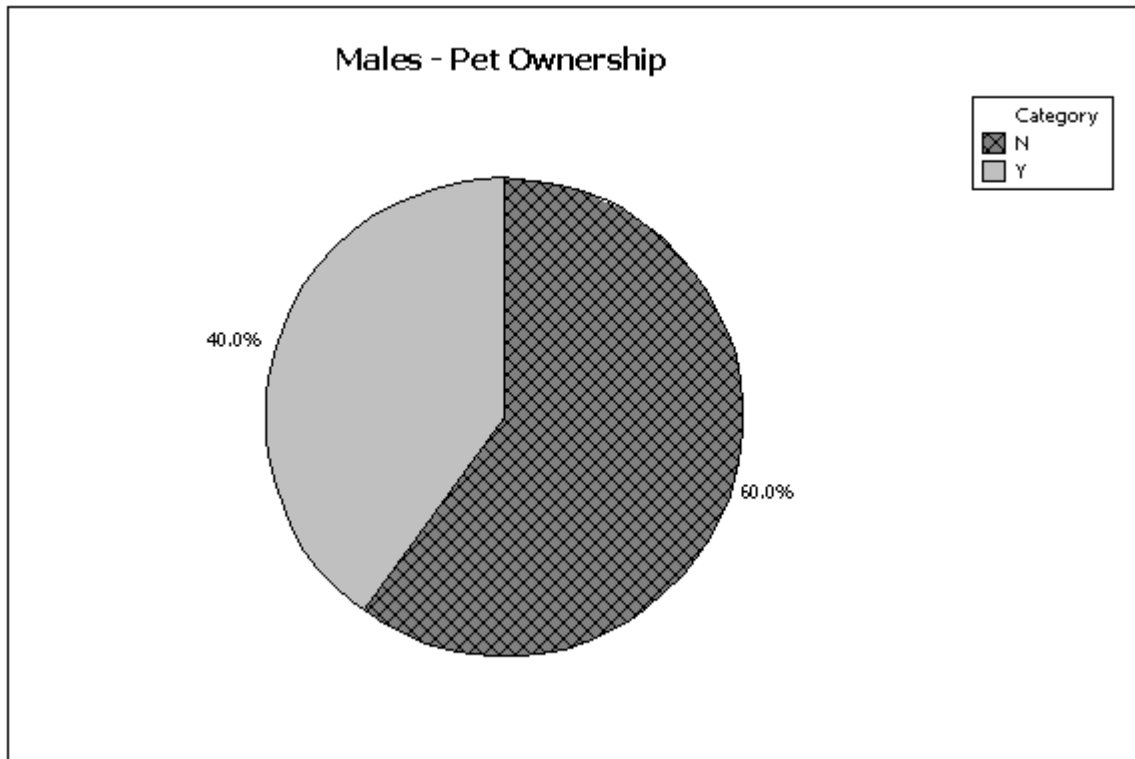

OR

94. Using the following cross-classification table, draw two pie charts that compare pet ownership for males vs. females. Are gender and pet ownership related?

	Own a pet	Don't own a pet
Females	75	25
Males	40	60

ANS:
The pie charts below show gender and pet ownership are related. More females own pets than males (75% vs. 40%).

Males - Pet Ownership

Category
N
Y

40.0%

60.0%

PTS: 1   REF: SECTION 2.3
NAT: Analytic; Descriptive Statistics