1) Scott Tarnowski owns a pet grooming shop. His prices for grooming dogs are based on the size of the dog. His records from last year are summarized below.

<table>
<thead>
<tr>
<th>Class</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large</td>
<td>345</td>
</tr>
<tr>
<td>Medium</td>
<td>830</td>
</tr>
<tr>
<td>Small</td>
<td>645</td>
</tr>
</tbody>
</table>

Construct a frequency table including relative frequencies and percentages.

2) The preschool children at Elmwood Elementary School were asked to name their favorite color. The results are listed below.

yellow  yellow  red  purple  blue  blue  yellow  blue  red  blue  red  purple  purple  purple  red  blue  purple  blue  green

Construct a frequency distribution and a relative frequency distribution.

The bar graph shows the number of tickets sold each week by the garden club for their annual flower show.

3) During which week was the most number of tickets sold?

4) How many tickets were sold during week 4?
During which week was the fewest number of tickets sold?

Solve the problem.

Retailers are always interested in determining why a customer selected their store to make a purchase. A sporting goods retailer conducted a customer survey to determine why its customers shopped at the store. The results are shown here. What percentage of the customers responded that the merchandise was the reason they shopped at the store?

The Excel frequency bar graph below describes the employment status of a random sample of U.S. adults. Use the bar graph to answer the question.

What is the percentage of those having no job?
The following double-bar graph illustrates the revenue for a company for the four quarters of the year for two different years. Use the graph to answer the question.

![Double-Bar Graph]

8) In what quarter was the revenue the least for 2000?

The circle graph shows the results of the student council presidential election.

9) Student Council President

![Circle Graph]

The circle graph shows what percent of the vote each person received.

What percent of the votes did Ming and Ann receive together?
Solve the problem.

10) Scott Tarnowski owns a pet grooming shop. His prices for grooming dogs are based on the size of the dog. His records from last year are summarized below.

<table>
<thead>
<tr>
<th>Class</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large</td>
<td>345</td>
</tr>
<tr>
<td>Medium</td>
<td>830</td>
</tr>
<tr>
<td>Small</td>
<td>645</td>
</tr>
</tbody>
</table>

Portray the data in a pie chart using the class percentages.

11) For the data below, construct a frequency histogram, frequency polygon, relative frequency histogram, and density histogram.

<table>
<thead>
<tr>
<th>Height (in inches)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 - under 52</td>
<td>5</td>
</tr>
<tr>
<td>52 - under 54</td>
<td>8</td>
</tr>
<tr>
<td>54 - under 56</td>
<td>12</td>
</tr>
<tr>
<td>56 - under 58</td>
<td>13</td>
</tr>
<tr>
<td>58 - 60</td>
<td>11</td>
</tr>
</tbody>
</table>

12) The grade point averages for 40 students are listed below. Construct a frequency histogram, frequency polygon, relative frequency histogram, and density histogram. Use eight classes.

2.0  3.2  1.8  2.9  0.9  4.0  3.3  2.9  3.6  0.8  
3.1  2.4  2.4  2.3  1.6  1.6  4.0  3.1  3.2  1.8  
2.2  2.2  1.7  0.5  3.6  3.4  1.9  2.0  3.0  1.1  
3.0  4.0  4.0  2.1  1.9  1.1  0.5  3.2  3.0  2.2  

13) The heights (in inches) of 30 adult males are listed below. Construct a frequency histogram, frequency polygon, relative frequency histogram, and density histogram. Use five classes.

70  72  71  70  69  73  69  68  70  71
67  71  70  74  69  68  71  71  71  72
69  71  68  67  73  74  70  71  69  68

14) The grade point averages for 40 students are listed below. Construct a frequency distribution, a relative frequency distribution, a cumulative frequency distribution, and a relative cumulative frequency distribution using eight classes.

2.0  3.2  1.8  2.9  0.9  4.0  3.3  2.9  3.6  0.8  
3.1  2.4  2.4  2.3  1.6  1.6  4.0  3.1  3.2  1.8  
2.2  2.2  1.7  0.5  3.6  3.4  1.9  2.0  3.0  1.1  
3.0  4.0  4.0  2.1  1.9  1.1  0.5  3.2  3.0  2.2
15) The Highway Patrol, using radar, checked the speeds (in mph) of 30 passing motorists at a checkpoint. The results are listed below. Construct a frequency distribution, a relative frequency distribution, a cumulative frequency distribution, and a relative cumulative frequency distribution using six classes.

44  38  41  50  36  36 43  42  49  48  
35  40  37  41  43  50  45  45  39  38  
50  41  47  36  35  40  42  43  48  33

16) The grade point averages for 40 students are listed below. Construct a frequency ogive using eight classes.

2.0  3.2  1.8  2.9  0.9  4.0  3.3  2.9  3.6  0.8  
3.1  2.4  2.4  2.3  1.6  1.6  4.0  3.1  3.2  1.8  
2.2  2.2  1.7  0.5  3.6  3.4  1.9  2.0  3.0  1.1  
3.0  4.0  4.0  2.1  1.9  1.1  0.5  3.2  3.0  2.2

17) The Highway Patrol, using radar, checked the speeds (in mph) of 30 passing motorists at a checkpoint. The results are listed below. Construct a frequency ogive using six classes.

44  38  41  50  36  36 43  42  49  48  
35  40  37  41  43  50  45  45  39  38  
50  41  47  36  35  40  42  43  48  33

18) The heights (in inches) of 30 adult males are listed below. Construct a relative frequency ogive using five classes.

70  72  71  70  69  73  69  68  70  71  
67  71  70  74  69  68  71  71  71  72  
69  71  68  67  73  74  70  71  69  68

19) A medical research team studied the ages of patients who had strokes caused by stress. The ages of 34 patients who suffered stress strokes were as follows.

29  30  36  41  45  50  57  61  28  50  36  58  
60  38  36  47  40  32  58  46  61  40  55  32  
61  56  45  46  62  36  38  40  50  27

Construct a grouped-data table for these ages. Use 8 classes beginning with a lower class limit of 25.

20) Lori asked 24 students how many hours they had spent doing homework during the previous week. The results are shown below.

10  10  10  9  10  10  15  13  10  9  12  10  
10  12  10  12  10  10  13  10 12  13  9

Construct a grouped-data table. Use 4 classes, a class width of 2 hours, and a lower limit of 8 for class 1.
21) The following figures represent Jennifer's monthly charges for long distance telephone calls for the past twelve months.

<table>
<thead>
<tr>
<th>Charge 1</th>
<th>Charge 2</th>
<th>Charge 3</th>
<th>Charge 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.99</td>
<td>12.80</td>
<td>13.86</td>
<td>18.04</td>
</tr>
<tr>
<td>10.04</td>
<td>16.20</td>
<td>8.87</td>
<td>13.43</td>
</tr>
<tr>
<td>14.23</td>
<td>13.96</td>
<td>13.74</td>
<td>12.72</td>
</tr>
</tbody>
</table>

Construct a grouped-data table with 4 classes.

**Construct the requested grouped-data table. Use classes based on a single value.**

22) A car insurance company conducted a survey to find out how many car accidents people had been involved in. They selected a sample of 32 adults between the ages of 30 and 70 and asked each person how many accidents they had been involved in the past ten years. The following data were obtained.

<table>
<thead>
<tr>
<th>Accidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

Construct a grouped-data table for the number of car accidents.

23) A teacher asked each of her students how many novels they had read in the previous six months. The results are shown below.

<table>
<thead>
<tr>
<th>Novels Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>12</td>
</tr>
</tbody>
</table>

Construct a grouped-data table for the number of novels read.

**Construct the requested histogram.**

24) The table gives the frequency distribution for the data involving the number of television sets per household for a sample of 100 U.S. households.

<table>
<thead>
<tr>
<th># of TVs</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

Construct a frequency histogram.
25) The table gives the frequency distribution for the data involving the number of radios per household for a sample of 80 U.S. households.

<table>
<thead>
<tr>
<th># of TVs</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

Construct a frequency histogram.

Construct a dotplot for the given data.

26) Attendance records at a school show the number of days each student was absent during the year. The days absent for each student were as follows.
9 3 4 2 8 6 3 4 0 6 7 3 4 2 2

27) A store manager counts the number of customers who make a purchase in his store each day. The data are as follows.
10 11 8 14 7 10 11 8 7

28) The frequency chart shows the distribution of defects for the machines used to produce a product.

<table>
<thead>
<tr>
<th>Defects</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>
Construct a pie chart representing the given data set.

29) The following data give the distribution of the types of houses in a town containing 45,000 houses.

<table>
<thead>
<tr>
<th>House Type</th>
<th>Frequency</th>
<th>Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cape</td>
<td>11,250</td>
<td>0.25</td>
</tr>
<tr>
<td>Garrison</td>
<td>18,000</td>
<td>0.35</td>
</tr>
<tr>
<td>Split</td>
<td>15,750</td>
<td>0.40</td>
</tr>
</tbody>
</table>

30) The following figures give the distribution of land (in acres) for a county containing 64,000 acres.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acres</th>
<th>Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest</td>
<td>9600</td>
<td>0.15</td>
</tr>
<tr>
<td>Farm</td>
<td>6400</td>
<td>0.10</td>
</tr>
<tr>
<td>Urban</td>
<td>48,000</td>
<td>0.75</td>
</tr>
</tbody>
</table>

31) The data below represent the results of a poll in which the following question was asked: “To what degree are you satisfied with your current health insurance?”

- Very: 13%
- Somewhat: 30%
- Not at All: 35%
- No opinion: 22%
Construct the requested graph.


<table>
<thead>
<tr>
<th>Winner</th>
<th>Frequency</th>
<th>Relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Evert</td>
<td>2</td>
<td>0.10</td>
</tr>
<tr>
<td>V. Wade</td>
<td>1</td>
<td>0.05</td>
</tr>
<tr>
<td>M. Navratilova</td>
<td>9</td>
<td>0.45</td>
</tr>
<tr>
<td>C. Martinez</td>
<td>1</td>
<td>0.05</td>
</tr>
<tr>
<td>S. Graf</td>
<td>6</td>
<td>0.30</td>
</tr>
<tr>
<td>E. Goolagong</td>
<td>1</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Construct a relative-frequency polygon for the given data.

33) The table contains the frequency and relative-frequency distributions for the ages of the employees in a particular company department.

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Frequency</th>
<th>Relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>20–&lt;30</td>
<td>6</td>
<td>0.375</td>
</tr>
<tr>
<td>30–&lt;40</td>
<td>3</td>
<td>0.1875</td>
</tr>
<tr>
<td>40–&lt;50</td>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>50–&lt;60</td>
<td>2</td>
<td>0.125</td>
</tr>
<tr>
<td>60–&lt;70</td>
<td>1</td>
<td>0.0625</td>
</tr>
</tbody>
</table>

Provide the requested response.

34) The table contains data from a study of daily study time for 40 students from Statistics 101. In constructing an ogive from the data, what quantity should be assigned to each axis.

<table>
<thead>
<tr>
<th>Minutes on homework</th>
<th>Number of students</th>
<th>Relative frequency</th>
<th>Cumulative relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–&lt;15</td>
<td>2</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>15–&lt;30</td>
<td>4</td>
<td>0.10</td>
<td>0.15</td>
</tr>
<tr>
<td>30–&lt;45</td>
<td>8</td>
<td>0.20</td>
<td>0.35</td>
</tr>
<tr>
<td>45–&lt;60</td>
<td>18</td>
<td>0.45</td>
<td>0.80</td>
</tr>
<tr>
<td>60–&lt;75</td>
<td>4</td>
<td>0.10</td>
<td>0.90</td>
</tr>
<tr>
<td>75–&lt;90</td>
<td>4</td>
<td>0.10</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Construct a stem-and-leaf diagram for the given data.

35) The following data show the number of laps run by each participant in a marathon.

46 65 55 43 51 48 57 30 43 49 32 56

36) The attendance counts for this season's basketball games are listed below.

227 239 215 219
221 233 229 233
235 228 245 231

37) The diastolic blood pressures for a sample of patients at a clinic were as follows. The measurements are in mmHg.

78 87 91 85 97 102 73 90 110 105
94 85 81 95 77 106 84 111 83 92
79 81 96 88 100 85 89 101 83 120
88 95 78 74 105 85 87 92 114 83

Construct an ordered stem-and-leaf diagram for the given data.

38) Twenty-four workers were asked how long it usually took them to travel to work each day. The data below are given in minutes.

20 35 42 52 65 20 60 49 24 37 23 24
22 20 41 25 28 27 50 47 58 30 32 48

39) The attendance counts for this season's basketball games are listed below.

227 239 215 219
221 233 229 233
235 228 245 231

40) The diastolic blood pressures for a sample of patients at a clinic were as follows. The measurements are in mmHg.

78 87 91 85 97 102 73 90 110 105
94 85 81 95 77 106 84 111 83 92
79 81 96 88 100 85 89 101 83 120
88 95 78 74 105 85 87 92 114 83
Construct a stem-and-leaf diagram for the given data using two or five lines per stem as specified.

41) The diastolic blood pressures for a sample of patients at a clinic were as follows. The measurements are in mmHg.

<table>
<thead>
<tr>
<th></th>
<th>78</th>
<th>87</th>
<th>91</th>
<th>85</th>
<th>97</th>
<th>102</th>
<th>73</th>
<th>90</th>
<th>102</th>
<th>105</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>94</td>
<td>85</td>
<td>81</td>
<td>95</td>
<td>77</td>
<td>106</td>
<td>84</td>
<td>101</td>
<td>83</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>79</td>
<td>81</td>
<td>96</td>
<td>88</td>
<td>100</td>
<td>85</td>
<td>89</td>
<td>87</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>88</td>
<td>95</td>
<td>78</td>
<td>74</td>
<td>108</td>
<td>85</td>
<td>87</td>
<td>92</td>
<td>97</td>
<td>83</td>
</tr>
</tbody>
</table>

Construct a stem-and-leaf diagram using two lines per stem.

42) The maximum recorded temperatures (in degrees Fahrenheit) for 35 different U.S. cities are given below.

<table>
<thead>
<tr>
<th></th>
<th>108</th>
<th>125</th>
<th>119</th>
<th>109</th>
<th>112</th>
<th>104</th>
<th>118</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>110</td>
<td>115</td>
<td>113</td>
<td>108</td>
<td>116</td>
<td>105</td>
<td>113</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>111</td>
<td>114</td>
<td>106</td>
<td>112</td>
<td>119</td>
<td>107</td>
</tr>
<tr>
<td></td>
<td>110</td>
<td>112</td>
<td>104</td>
<td>121</td>
<td>106</td>
<td>108</td>
<td>123</td>
</tr>
<tr>
<td></td>
<td>105</td>
<td>117</td>
<td>124</td>
<td>115</td>
<td>110</td>
<td>114</td>
<td>113</td>
</tr>
</tbody>
</table>

Construct a stem-and-leaf diagram using two lines per stem.

43) The ages of the 45 members of a track and field team are listed below. Construct an ordered stem-and-leaf diagram using two lines per stem.

<table>
<thead>
<tr>
<th></th>
<th>21</th>
<th>18</th>
<th>42</th>
<th>35</th>
<th>32</th>
<th>21</th>
<th>44</th>
<th>25</th>
<th>38</th>
<th>48</th>
<th>14</th>
<th>19</th>
<th>23</th>
<th>22</th>
<th>28</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>32</td>
<td>34</td>
<td>27</td>
<td>31</td>
<td>17</td>
<td>16</td>
<td>41</td>
<td>37</td>
<td>22</td>
<td>24</td>
<td>33</td>
<td>32</td>
<td>21</td>
<td>26</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>27</td>
<td>32</td>
<td>30</td>
<td>20</td>
<td>18</td>
<td>17</td>
<td>21</td>
<td>15</td>
<td>26</td>
<td>36</td>
<td>31</td>
<td>40</td>
<td>16</td>
<td>25</td>
</tr>
</tbody>
</table>
Group the bivariate data into a contingency table.

44) The table below provides data on sex, political party affiliation, and income bracket for a sample of people questioned during a poll. Group the bivariate data for the two variables "sex" and "political party" into a contingency table.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Political Party</th>
<th>Income Bracket</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Rep</td>
<td>High</td>
</tr>
<tr>
<td>F</td>
<td>Dem</td>
<td>Middle</td>
</tr>
<tr>
<td>F</td>
<td>Dem</td>
<td>Middle</td>
</tr>
<tr>
<td>M</td>
<td>Dem</td>
<td>Low</td>
</tr>
<tr>
<td>F</td>
<td>Other</td>
<td>Middle</td>
</tr>
<tr>
<td>M</td>
<td>Rep</td>
<td>Low</td>
</tr>
<tr>
<td>F</td>
<td>Rep</td>
<td>High</td>
</tr>
<tr>
<td>M</td>
<td>Rep</td>
<td>High</td>
</tr>
<tr>
<td>M</td>
<td>Dem</td>
<td>High</td>
</tr>
<tr>
<td>F</td>
<td>Rep</td>
<td>Low</td>
</tr>
<tr>
<td>M</td>
<td>Dem</td>
<td>High</td>
</tr>
<tr>
<td>F</td>
<td>Rep</td>
<td>Middle</td>
</tr>
<tr>
<td>F</td>
<td>Dem</td>
<td>Middle</td>
</tr>
<tr>
<td>M</td>
<td>Dem</td>
<td>Middle</td>
</tr>
<tr>
<td>M</td>
<td>Rep</td>
<td>Low</td>
</tr>
<tr>
<td>M</td>
<td>Rep</td>
<td>Low</td>
</tr>
<tr>
<td>F</td>
<td>Other</td>
<td>High</td>
</tr>
<tr>
<td>M</td>
<td>Other</td>
<td>Middle</td>
</tr>
<tr>
<td>F</td>
<td>Dem</td>
<td>Low</td>
</tr>
<tr>
<td>M</td>
<td>Dem</td>
<td>Middle</td>
</tr>
<tr>
<td>M</td>
<td>Rep</td>
<td>Low</td>
</tr>
<tr>
<td>F</td>
<td>Dem</td>
<td>Middle</td>
</tr>
</tbody>
</table>
45) The table below provides data on sex, political party affiliation, and income bracket for a sample of people questioned during a poll. Group the bivariate data for the two variables "political party" and "income bracket" into a contingency table.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Political Party</th>
<th>Income Bracket</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Rep</td>
<td>High</td>
</tr>
<tr>
<td>F</td>
<td>Dem</td>
<td>Middle</td>
</tr>
<tr>
<td>F</td>
<td>Dem</td>
<td>Middle</td>
</tr>
<tr>
<td>M</td>
<td>Dem</td>
<td>Low</td>
</tr>
<tr>
<td>F</td>
<td>Other</td>
<td>Middle</td>
</tr>
<tr>
<td>M</td>
<td>Rep</td>
<td>Low</td>
</tr>
<tr>
<td>F</td>
<td>Rep</td>
<td>High</td>
</tr>
<tr>
<td>M</td>
<td>Rep</td>
<td>High</td>
</tr>
<tr>
<td>M</td>
<td>Dem</td>
<td>High</td>
</tr>
<tr>
<td>F</td>
<td>Rep</td>
<td>Low</td>
</tr>
<tr>
<td>M</td>
<td>Dem</td>
<td>High</td>
</tr>
<tr>
<td>F</td>
<td>Rep</td>
<td>Middle</td>
</tr>
<tr>
<td>F</td>
<td>Dem</td>
<td>Middle</td>
</tr>
<tr>
<td>M</td>
<td>Dem</td>
<td>Middle</td>
</tr>
<tr>
<td>M</td>
<td>Rep</td>
<td>Low</td>
</tr>
<tr>
<td>F</td>
<td>Dem</td>
<td>High</td>
</tr>
<tr>
<td>M</td>
<td>Rep</td>
<td>Low</td>
</tr>
<tr>
<td>F</td>
<td>Other</td>
<td>High</td>
</tr>
<tr>
<td>M</td>
<td>Other</td>
<td>Middle</td>
</tr>
<tr>
<td>F</td>
<td>Dem</td>
<td>Low</td>
</tr>
<tr>
<td>M</td>
<td>Dem</td>
<td>Middle</td>
</tr>
<tr>
<td>M</td>
<td>Rep</td>
<td>Low</td>
</tr>
<tr>
<td>F</td>
<td>Dem</td>
<td>Middle</td>
</tr>
</tbody>
</table>

Use the contingency table to solve the problem.

46) The contingency table above shows the blood types of a sample of patients cross classified by sex. Fill in the missing entries.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Blood Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O</td>
</tr>
<tr>
<td>Female</td>
<td>46</td>
</tr>
<tr>
<td>Male</td>
<td>47</td>
</tr>
<tr>
<td>Total</td>
<td>98</td>
</tr>
</tbody>
</table>
47) The contingency table above shows the blood types of a sample of patients cross classified by sex. How many people in the sample have blood type B?

<table>
<thead>
<tr>
<th>Sex</th>
<th>O</th>
<th>A</th>
<th>B</th>
<th>AB</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>42</td>
<td>41</td>
<td>16</td>
<td>3</td>
<td>102</td>
</tr>
<tr>
<td>Male</td>
<td>49</td>
<td>48</td>
<td>11</td>
<td>3</td>
<td>111</td>
</tr>
<tr>
<td>Total</td>
<td>91</td>
<td>89</td>
<td>27</td>
<td>6</td>
<td>213</td>
</tr>
</tbody>
</table>

48) The following contingency table provides a joint frequency distribution for a group of retired people by career and age at retirement.

<table>
<thead>
<tr>
<th>Age at Retirement</th>
<th>50-55</th>
<th>56-60</th>
<th>61-65</th>
<th>Over 65</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-55 A₁</td>
<td>12</td>
<td>41</td>
<td>85</td>
<td>36</td>
<td>174</td>
</tr>
<tr>
<td>56-60 A₂</td>
<td>9</td>
<td>49</td>
<td>94</td>
<td>45</td>
<td>197</td>
</tr>
<tr>
<td>61-65 A₃</td>
<td>21</td>
<td>45</td>
<td>63</td>
<td>49</td>
<td>178</td>
</tr>
<tr>
<td>Over 65 A₄</td>
<td>18</td>
<td>44</td>
<td>70</td>
<td>50</td>
<td>182</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>179</td>
<td>312</td>
<td>180</td>
<td>731</td>
</tr>
</tbody>
</table>

How many of the people who retired between 61 and 65 were attorneys?

49) The contingency table above shows the blood types of a sample of people cross classified by sex. What percentage of people in the sample have blood type B?

<table>
<thead>
<tr>
<th>Sex</th>
<th>O</th>
<th>A</th>
<th>B</th>
<th>AB</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>40</td>
<td>43</td>
<td>12</td>
<td>6</td>
<td>101</td>
</tr>
<tr>
<td>Male</td>
<td>44</td>
<td>48</td>
<td>14</td>
<td>4</td>
<td>110</td>
</tr>
<tr>
<td>Total</td>
<td>84</td>
<td>91</td>
<td>26</td>
<td>10</td>
<td>211</td>
</tr>
</tbody>
</table>
The contingency table above shows the blood types of a sample of people cross classified by sex. What percentage of those people with blood type A are women?

The following contingency table shows the popular votes cast in the 1984 presidential election cross classified by region and political party. Data are in thousands, rounded to the nearest thousand.

What percentage of the voters were in the Midwest?
52) The following contingency table shows the popular votes cast in the 1984 presidential election cross classified by region and political party. Data are in thousands, rounded to the nearest thousand.

<table>
<thead>
<tr>
<th>Region</th>
<th>Demo. $P_1$</th>
<th>Repub. $P_2$</th>
<th>Other $P_3$</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast $R_1$</td>
<td>9046</td>
<td>11,336</td>
<td>101</td>
<td>20,483</td>
</tr>
<tr>
<td>Midwest $R_2$</td>
<td>10,511</td>
<td>14,761</td>
<td>169</td>
<td>25,441</td>
</tr>
<tr>
<td>South $R_3$</td>
<td>10,998</td>
<td>17,699</td>
<td>136</td>
<td>28,833</td>
</tr>
<tr>
<td>West $R_4$</td>
<td>7022</td>
<td>10,659</td>
<td>214</td>
<td>17,895</td>
</tr>
<tr>
<td>Total</td>
<td>37,577</td>
<td>54,455</td>
<td>620</td>
<td>92,652</td>
</tr>
</tbody>
</table>

What percentage of those who voted Republican were in the South?

Solve the problem.

53) The data below are the final exam scores of 10 randomly selected statistics students and the number of hours they studied for the exam. Construct a scatter diagram for the data.

<table>
<thead>
<tr>
<th>Hours, x</th>
<th>Scores, y</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>65</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
</tr>
<tr>
<td>8</td>
<td>88</td>
</tr>
<tr>
<td>2</td>
<td>66</td>
</tr>
<tr>
<td>4</td>
<td>78</td>
</tr>
<tr>
<td>4</td>
<td>85</td>
</tr>
<tr>
<td>5</td>
<td>90</td>
</tr>
<tr>
<td>6</td>
<td>90</td>
</tr>
<tr>
<td>3</td>
<td>71</td>
</tr>
</tbody>
</table>

54) The data below are the ages and systolic blood pressures (measured in millimeters of mercury) of 9 randomly selected adults. Construct a scatter diagram for the data.

<table>
<thead>
<tr>
<th>Age, x</th>
<th>Pressure, y</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>116</td>
</tr>
<tr>
<td>41</td>
<td>120</td>
</tr>
<tr>
<td>45</td>
<td>123</td>
</tr>
<tr>
<td>48</td>
<td>131</td>
</tr>
<tr>
<td>51</td>
<td>142</td>
</tr>
<tr>
<td>53</td>
<td>145</td>
</tr>
<tr>
<td>57</td>
<td>148</td>
</tr>
<tr>
<td>61</td>
<td>150</td>
</tr>
<tr>
<td>65</td>
<td>152</td>
</tr>
</tbody>
</table>

55) A manager wishes to determine the relationship between the number of miles (in hundreds of miles) the manager's sales representatives travel per month and the amount of sales (in thousands of dollars) per month. Construct a scatter diagram for the data.

<table>
<thead>
<tr>
<th>Miles traveled, x</th>
<th>Sales, y</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td>3</td>
<td>33</td>
</tr>
<tr>
<td>10</td>
<td>78</td>
</tr>
<tr>
<td>7</td>
<td>62</td>
</tr>
<tr>
<td>8</td>
<td>65</td>
</tr>
<tr>
<td>15</td>
<td>61</td>
</tr>
<tr>
<td>3</td>
<td>48</td>
</tr>
<tr>
<td>1</td>
<td>55</td>
</tr>
<tr>
<td>11</td>
<td>120</td>
</tr>
</tbody>
</table>
56) In an area of the Midwest, records were kept on the relationship between the rainfall (in inches) and the yield of wheat (bushels per acre). Construct a scatter diagram for the data.

<table>
<thead>
<tr>
<th>Rainfall (in inches), x</th>
<th>10.5</th>
<th>8.8</th>
<th>13.4</th>
<th>12.5</th>
<th>18.8</th>
<th>10.3</th>
<th>7.0</th>
<th>15.6</th>
<th>16.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield (bushels per acre), y</td>
<td>50.5</td>
<td>46.2</td>
<td>58.8</td>
<td>59.0</td>
<td>82.4</td>
<td>49.2</td>
<td>31.9</td>
<td>76.0</td>
<td>78.8</td>
</tr>
</tbody>
</table>

57) The scores of nine members of a local community college women's golf team in two rounds of tournament play are listed below.

<table>
<thead>
<tr>
<th>Player</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round 1</td>
<td>85</td>
<td>90</td>
<td>87</td>
<td>78</td>
<td>92</td>
<td>85</td>
<td>79</td>
<td>93</td>
<td>86</td>
</tr>
<tr>
<td>Round 2</td>
<td>90</td>
<td>87</td>
<td>85</td>
<td>84</td>
<td>86</td>
<td>78</td>
<td>77</td>
<td>91</td>
<td>82</td>
</tr>
</tbody>
</table>

Construct a scatter diagram for the data.
Answer Key
Testname: ADDITIONAL EXERCISES ON CHAPTER 2

1) Class |
Frequency | Relative Frequency | Percentage |
--- | --- | --- | --- |
Large | 345 | .190 | 19.0 |
Medium | 830 | .456 | 45.6 |
Small | 645 | .354 | 35.4 |
Total | 1820 | 1.000 | 100.0 |

2) Color |
Frequency | Relative Frequency |
--- | --- |
yellow | 3 | 0.15 |
red | 4 | 0.20 |
purple | 5 | 0.25 |
blue | 7 | 0.35 |
green | 1 | 0.05 |

3) Week 4
4) 59 tickets
5) Week 2
6) 42.9%
7) 15%
8) second quarter
9) 41%

10) ![Circle Graph]

11) ![Frequency Polygon]

12) ![Frequency Polygon]
13)

<table>
<thead>
<tr>
<th>GPA</th>
<th>Frequency</th>
<th>Relative Frequency</th>
<th>Cumulative Frequency</th>
<th>Cumulative Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5–0.9</td>
<td>4</td>
<td>0.10</td>
<td>4</td>
<td>0.10</td>
</tr>
<tr>
<td>1.0–1.4</td>
<td>2</td>
<td>0.05</td>
<td>6</td>
<td>0.15</td>
</tr>
<tr>
<td>1.5–1.9</td>
<td>7</td>
<td>0.175</td>
<td>13</td>
<td>0.325</td>
</tr>
<tr>
<td>2.0–2.4</td>
<td>9</td>
<td>0.225</td>
<td>22</td>
<td>0.55</td>
</tr>
<tr>
<td>2.5–2.9</td>
<td>2</td>
<td>0.05</td>
<td>24</td>
<td>0.60</td>
</tr>
<tr>
<td>3.0–3.4</td>
<td>10</td>
<td>0.25</td>
<td>34</td>
<td>0.85</td>
</tr>
<tr>
<td>3.5–3.9</td>
<td>2</td>
<td>0.05</td>
<td>36</td>
<td>0.90</td>
</tr>
<tr>
<td>4.0–4.4</td>
<td>4</td>
<td>0.10</td>
<td>40</td>
<td>1</td>
</tr>
</tbody>
</table>

14)

<table>
<thead>
<tr>
<th>Speed (in mph)</th>
<th>Frequency</th>
<th>Relative Frequency</th>
<th>Cumulative Frequency</th>
<th>Cumulative Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>33–35</td>
<td>3</td>
<td>0.10</td>
<td>3</td>
<td>0.10</td>
</tr>
<tr>
<td>36–38</td>
<td>6</td>
<td>0.20</td>
<td>9</td>
<td>0.30</td>
</tr>
<tr>
<td>39–41</td>
<td>6</td>
<td>0.20</td>
<td>15</td>
<td>0.50</td>
</tr>
<tr>
<td>42–44</td>
<td>6</td>
<td>0.20</td>
<td>21</td>
<td>0.70</td>
</tr>
<tr>
<td>45–47</td>
<td>3</td>
<td>0.10</td>
<td>24</td>
<td>0.80</td>
</tr>
<tr>
<td>48–50</td>
<td>6</td>
<td>0.20</td>
<td>30</td>
<td>1</td>
</tr>
</tbody>
</table>
Answer Key
Testname: ADDITIONAL EXERCISES ON CHAPTER 2

18) Ogive

<table>
<thead>
<tr>
<th>Height (in inches)</th>
<th>Cumulative Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>66.0</td>
<td>0.00</td>
</tr>
<tr>
<td>68.4</td>
<td>0.333</td>
</tr>
<tr>
<td>71.4</td>
<td>0.667</td>
</tr>
<tr>
<td>74.0</td>
<td>1.000</td>
</tr>
</tbody>
</table>

19) Age | Frequency

| 25–<30 | 3 |
| 30–<35 | 3 |
| 35–<40 | 6 |
| 40–<45 | 4 |
| 45–<50 | 5 |
| 50–<55 | 3 |
| 55–<60 | 5 |
| 60–<65 | 5 |

20) Hours | Frequency

| 8–<10 | 3 |
| 10–<12 | 13 |
| 12–<14 | 7 |
| 14–<16 | 1 |

21) Charges | Frequency

| 7.00–<10 | 2 |
| 10.00–<13 | 3 |
| 13.00–<16 | 5 |
| 16.00–<19 | 2 |

22) Number of accidents | Frequency

| 0 | 11 |
| 1 | 10 |
| 2 | 5 |
| 3 | 3 |
| 4 | 2 |
| 5 | 1 |
Answer Key  
Testname: ADDITIONAL EXERCISES ON CHAPTER 2

23)  

<table>
<thead>
<tr>
<th>Number of novels</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
</tr>
</tbody>
</table>

24)  

![Histogram for 24) with bars for values 1 to 6 and frequencies 50, 40, 30, 20, 10, 50 respectively.]

25)  

![Histogram for 25) with bars for values 1 to 6 and frequencies 10, 20, 30, 40, 50 respectively.]

26)  

![Bar chart for 26) with dots at positions 0, 5, 10, and 15.]

27)  

![Bar chart for 27) with dots at positions 5, 10, and 15.]

22
Answer Key
Testname: ADDITIONAL EXERCISES ON CHAPTER 2

28) 

29) 

30) 

31) 

32)
Answer Key
Testname: ADDITIONAL EXERCISES ON CHAPTER 2

33)

```
<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>0.375</td>
</tr>
<tr>
<td>25</td>
<td>0.25</td>
</tr>
<tr>
<td>30</td>
<td>0.125</td>
</tr>
</tbody>
</table>
```

34) Minutes on homework on the x-axis and cumulative relative frequency on the y-axis

35)

```
<table>
<thead>
<tr>
<th>Minutes</th>
<th>Cumulative Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0.2</td>
</tr>
<tr>
<td>4</td>
<td>0.6</td>
</tr>
<tr>
<td>5</td>
<td>0.8</td>
</tr>
<tr>
<td>6</td>
<td>1.0</td>
</tr>
</tbody>
</table>
```

36)

```
<table>
<thead>
<tr>
<th>Minutes</th>
<th>Cumulative Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>0.5</td>
</tr>
<tr>
<td>22</td>
<td>0.7</td>
</tr>
<tr>
<td>23</td>
<td>0.9</td>
</tr>
<tr>
<td>24</td>
<td>1.0</td>
</tr>
</tbody>
</table>
```

37)

```
<table>
<thead>
<tr>
<th>Minutes</th>
<th>Cumulative Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>0.8</td>
</tr>
<tr>
<td>8</td>
<td>1.0</td>
</tr>
<tr>
<td>9</td>
<td>1.2</td>
</tr>
<tr>
<td>10</td>
<td>1.4</td>
</tr>
<tr>
<td>11</td>
<td>1.6</td>
</tr>
<tr>
<td>12</td>
<td>1.8</td>
</tr>
</tbody>
</table>
```

38)

```
<table>
<thead>
<tr>
<th>Minutes</th>
<th>Cumulative Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
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</tr>
<tr>
<td>3</td>
<td>0.025</td>
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<tr>
<td>4</td>
<td>0.127</td>
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<tr>
<td>5</td>
<td>0.028</td>
</tr>
<tr>
<td>6</td>
<td>0.05</td>
</tr>
</tbody>
</table>
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39)

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<table>
<thead>
<tr>
<th>Minutes</th>
<th>Cumulative Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>0.59</td>
</tr>
<tr>
<td>22</td>
<td>0.789</td>
</tr>
<tr>
<td>23</td>
<td>0.9359</td>
</tr>
<tr>
<td>24</td>
<td>1.0</td>
</tr>
</tbody>
</table>
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40)

```
<table>
<thead>
<tr>
<th>Minutes</th>
<th>Cumulative Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>0.347</td>
</tr>
<tr>
<td>8</td>
<td>0.513</td>
</tr>
<tr>
<td>9</td>
<td>0.622</td>
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<tr>
<td>10</td>
<td>0.645</td>
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<tr>
<td>11</td>
<td>0.656</td>
</tr>
<tr>
<td>12</td>
<td>0.660</td>
</tr>
</tbody>
</table>
```
Answer Key
Testname: ADDITIONAL EXERCISES ON CHAPTER 2

41) 7 34
    7 8798
    8 143133
    8 7558597857
    9 104202
    9 75657
    10 2210
    10 568

42) 10 44
    10 898567685
    11 203314202043
    11 9856975
    12 0134
    12 5

43) 1 4
    1 56677889
    2 0111122234
    2 5566778
    3 0011222234
    3 5678
    4 0124
    4 8

44) Political Party

<table>
<thead>
<tr>
<th>Sex</th>
<th>Dem</th>
<th>Rep</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Female</td>
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<td>3</td>
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<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>9</td>
<td>3</td>
<td>23</td>
</tr>
</tbody>
</table>

45) Income Bracket

<table>
<thead>
<tr>
<th>Party</th>
<th>Low</th>
<th>Middle</th>
<th>High</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dem.</td>
<td>2</td>
<td>6</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Rep.</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>2</td>
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<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>9</td>
<td>7</td>
<td>23</td>
</tr>
</tbody>
</table>

46) Blood Type

<table>
<thead>
<tr>
<th>Sex</th>
<th>O</th>
<th>A</th>
<th>B</th>
<th>AB</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>46</td>
<td>55</td>
<td>12</td>
<td>6</td>
<td>119</td>
</tr>
<tr>
<td>Male</td>
<td>52</td>
<td>47</td>
<td>12</td>
<td>6</td>
<td>117</td>
</tr>
</tbody>
</table>
| Total  | 98 | 102| 24 | 12 | 236   

47) 27
48) 85
49) 12.3%
50) 53.9%
51) 27.5%
52) 32.5%
53)

54)

55)
Answer Key
Testname: ADDITIONAL EXERCISES ON CHAPTER 2

56)

57)