The following frequency distribution will be used in the next four
questions. The variable is assumed to be continuous.

<table>
<thead>
<tr>
<th>value</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–10</td>
<td>4</td>
</tr>
<tr>
<td>10–15</td>
<td>4</td>
</tr>
<tr>
<td>15–25</td>
<td>11</td>
</tr>
<tr>
<td>25–30</td>
<td>9</td>
</tr>
<tr>
<td>30–35</td>
<td>12</td>
</tr>
<tr>
<td>35–40</td>
<td>15</td>
</tr>
<tr>
<td>40–42</td>
<td>8</td>
</tr>
<tr>
<td>42–45</td>
<td>10</td>
</tr>
<tr>
<td>45–47</td>
<td>6</td>
</tr>
<tr>
<td>47–50</td>
<td>7</td>
</tr>
<tr>
<td>50–55</td>
<td>9</td>
</tr>
<tr>
<td>55–60</td>
<td>5</td>
</tr>
</tbody>
</table>

1. Which bracket contains the mode?
   a) 30–35  b) 45–47  c) 35–40  d) 40–42  e) 42–45

2. Which bracket contains the median?
   a) 30–35  b) 45–47  c) 35–40  d) 40–42  e) 42–45

3. Which bracket contains the 70-th percentile?
   a) 30–35  b) 45–47  c) 35–40  d) 40–42  e) 42–45

4. Which of the following is the most descriptive of the shape of the
   histogram?
   a) a multi-humped curve
   b) a curve with a long left-hand tail
   c) a two-humped curve
   d) a curve with a long right-hand tail
   e) a normal curve
The following is data for a scatter diagram. It is used in the next four questions.

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
</tr>
</tbody>
</table>

5. What is the correlation coefficient for this data?
   a) −.22  b) −.36  c) −.44  d) −.5  e) −.72

6. What is the ideal center of the scatter diagram?
   a) (4, 5)  b) (4, 2)  c) (2, 3)  d) (3, 2)  e) (5, 4)

7. What is the slope of the SD line?
   a) −1.5  b) −.8  c) −1.25  d) −.67  e) −.4

8. What is the y-intercept of the SD line?
   a) 8.33  b) 7.67  c) 9.25  d) 5.5  e) 11.25

Suppose given a binormal distribution with
\[
\text{avg}(x)=80 \quad \text{avg}(y)=150 \\
\text{SD}(x)=50 \quad \text{SD}(y)=40 \quad r=.75
\]

We study it in the next nine questions.

9. What is the regression estimate for \( x = 40 \)?
   a) 112  b) 132  c) 118  d) 122  e) 126

10. What is the slope of the regression line?
    a) .8  b) .6  c) .75  d) 1.2  e) 1.5

11. What is the y-intercept of the regression line?
    a) 102  b) 67  c) 96  d) 82  e) 74

12. Suppose the \( x \)-value is in the 79-th percentile. What is the percentile value of its regression estimate?
    a) 67\(\frac{1}{2}\)%  b) 75%  c) 61%  d) 72\(\frac{1}{2}\)%  e) 64%

13. Suppose \( y = 100 \). What is the regression estimate for predicting the value of \( x \) from that of \( y \)?
    a) 62  b) 41  c) 33  d) 52  e) 38

14. What is the 16-th percentile of the \( y \)-distribution?
    a) 92  b) 102  c) 98  d) 106  e) 110
15. What is the percentile value of 150 in the \( x \)-distribution?
   a) 92\%  b) 87\%\  c) 94\frac{1}{2}\%  d) 82\%  e) 85\%

16. What percent of the \( x \)-values are between 40 and 150?
   a) 67\frac{1}{2}\%  b) 82\%  c) 71\%  d) 74\frac{1}{2}\%  e) 78\%

17. What percent of the \( x \)-values are between 105 and 150?
   a) 41\frac{1}{2}\%  b) 18\%  c) 27\frac{1}{2}\%  d) 23\%  e) 37\frac{1}{2}\%

Suppose given a binormal distribution with
\[
\begin{align*}
\text{avg}(x) &= 250 & \text{avg}(y) &= 150 \\
\text{SD}(x) &= 100 & \text{SD}(y) &= 60 \\
r &= -0.8
\end{align*}
\]

Control for \( x = 400 \).

18. What is the 80-th percentile of the controlled \( y \)-distribution?
   a) 138  b) 109  c) 124  d) 118  e) 112

19. What percent of the controlled \( y \)-values are between 90 and 120?
   a) 24\%  b) 21\frac{1}{2}\%  c) 27\frac{1}{2}\%  d) 18\%  e) 31\%

20. What is the percentile value of 60 in the controlled \( y \)-distribution?
   a) 42\%  b) 37\frac{1}{2}\%  c) 28\frac{1}{2}\%  d) 34\%  e) 31\%