1. Fill in the blanks with the proper vocabulary and terminology.

An ______________ is a single data value that is significantly larger or smaller than the rest of the data set.

A ______________ is a visual representation of the 5 number summary of a data set.

If a data set is skewed right, the mean will be ______________ than the median.

The ______________ rule tells us approximately what percentage of data falls within one, two, and three standard deviations from the mean of a normal distribution.

______________________________ measures the average distance all of the data values are from the mean.

Since we cannot access the entire __________________, we usually must draw data from a sample.

In a single-blind experiment, individuals in the control group are given a ______________.

In a linear model, the increment is by a constant amount, but in an exponential model, the increment is by a constant _____________.

The ________________ of a vertex of a graph is the number of edges hitting that vertex.

In a ________________ circuit, our goal is to hit every vertex exactly once.

2. The following boxplot compares scores on the Final Exam from two different professors.

Write the five-number summary for Professor A’s exam scores.

Both Professors decide to give an A to students who scored in the top 25% of their class. What exam score is needed to get an A in each class?

T F On Professor B’s exam, more students scored between 85 and 120 than scored between 30 and 35.

T F Half of the students in Professor A’s class had lower scores than the lowest score for Professor B.

Which Professor’s scores would have the higher standard deviation?
For numbers 3 and 4, refer to the following data sets:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<th>12</th>
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<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
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<tbody>
<tr>
<td><strong>K3</strong></td>
<td>16</td>
<td>17</td>
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<td>19</td>
<td>21</td>
<td>24</td>
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<td>46</td>
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<tr>
<td><strong>K4</strong></td>
<td>12</td>
<td>20</td>
<td>22</td>
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<td>30</td>
<td>31</td>
<td>33</td>
<td>35</td>
<td>37</td>
<td>41</td>
<td>41</td>
<td>42</td>
<td>51</td>
<td></td>
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</tbody>
</table>

3. Make a stemplot for each data set. (Try to keep your columns neat)

\[ K3 \]

\[ K4 \]

4. Based on those stemplots, pick the data set that looks most like a *normal* distribution and make a histogram for that set. Use four bins.

5. Calculate the standard deviation of the following data set.

\[ 40 \ 42 \ 43 \ 43 \ 48 \ 48 \ 51 \]

<table>
<thead>
<tr>
<th>Data values</th>
<th>Subtract the mean</th>
<th>Square</th>
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</thead>
<tbody>
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</tbody>
</table>
6. The cost of cell phones is normally distributed with a mean of $80 and a standard deviation of $15.
   a) If Candice just bought a cell phone for $104, what percentage of people spent less than her?

   b) Randy claims that about 88.5% of all phones are cheaper than his. How much did Randy’s phone cost?

   c) Within what range of prices do “almost all” cell phones fall? That is, what range of prices captures the middle 95% of all cell phone prices?

7. A survey is conducted of a simple random sample of 213 NAU students. 110 said they prefer online/electronic versions of textbooks to traditional hard-copy textbooks.
   a) What are the population and variable of interest in this study?

   b) What is the population parameter? Do we know its value? If so, state it.

   c) What is the sample statistic? Do we know its value? If so, state it.

   d) Find the standard deviation for this statistic and use it to construct and interpret a 95% confidence interval.
8. Suppose you randomly select one card from a standard deck. (52 cards total, 13 in each suite.)

Find the probability of each of the events below. Do not count Aces as face cards.

\[
\begin{align*}
P(\text{black}) &= & \\
P(\text{face}) &= & \\
P(\text{not heart}) &= & \\
P(\text{jack and black}) &= & \\
P(\text{ace or king}) &= & \\
P(\text{face given that red}) &= & \\
\end{align*}
\]

Within this context, identify two events which are disjoint.

Now suppose you randomly select two cards without replacement. Find the following probabilities.

\[
\begin{align*}
P(\text{black followed by black}) &= & \\
P(\text{jack followed by jack}) &= & \\
\end{align*}
\]

Finally, suppose your roommate offers you the following wager – he has taken all of the Aces out of the deck and you will draw one card from the rest of the deck. If you draw an even-numbered card, he’ll give you $1; if you draw an odd-numbered card, $2; if you draw a male card (Jack or King), he’ll give you $4; and if you draw a Queen, $8. If he charges you $3 to play, how much can you expect to win/lose on each play?

9. A recent news article claimed that “each 1.5°F increase in global average temperature will lead to a 0.0072% increase in global average sea level.”

Based on this claim, which of the following quantities is being described as the dependent variable and which is being described as the independent variable? Explain.

Are these quantities described as having a positive relationship or a negative relationship? Explain.

Is the relationship between these two quantities described as a linear relationship or an exponential relationship? Explain.
10. Match the following scatterplots with the corresponding correlation coefficients.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Scatterplot A]</td>
<td>![Scatterplot B]</td>
<td>![Scatterplot C]</td>
<td>![Scatterplot D]</td>
</tr>
</tbody>
</table>

- 0.45
- 0.65
- 0.97
- 0.93

11. Assume a linear model for the following problem. Tenneck College had an enrollment of 12,000 in 1984 and 14,000 in 2004.

What is the predicted enrollment in 2019?

When will the enrollment be greater than 15,500?

12. It costs a beekeeper $2.50 to make each pint jar of honey, and she sells the jars to stores at a price of $5.50 each. Her other monthly costs are the lease of the land and building ($1040 per month), general supplies and equipment ($150 per month), utilities ($350 per month), transportation ($500 per month) and fixed salaries ($5,500 per month).

What are her total expenses for the month?

How many jars of honey must she sell each month to break even?
13. The number of cell phone users grows at a rate of 11.7% per year. There were 14.2 million cell users in 2000. How many cell phone users are there now (2012)?

In what year will there be 160 million cell phone users?

14. If you want to have $42,000 saved in 10 years, how much do you need to put into an account now if the interest rate is 7.2% compounded weekly?

15. If you buy a car for $16,000 with a 5 year loan (6% APR), what is your monthly payment? How much do you end up paying for the car total?

16. Does the following graph have an Euler circuit? Explain.

If the graph represents streets in a neighborhood which need to be plowed, what does it mean (in terms of streets and snow, not vertices and edges) that the graph does/doesn’t have an Euler circuit?
17. The vertex and edge set of a graph is given below. Draw a representation of the graph.

\[ V = \{A, C, E, G, I, K, M\} \]

\[ E = \{\{A, E\}, \{A, G\}, \{A, I\}, \{C, E\}, \{E, G\}, \{E, K\}, \{E, M\}, \{G, I\}, \{G, M\}, \{I, M\}, \{K, M\}\} \]

What is the degree (or valence) of vertex \(G\)? ______

State a path from vertex \(A\) to vertex \(K\).

Does the above graph have a Hamiltonian circuit? ______

18. For the following graph, find a Hamiltonian circuit by using the Nearest Neighbor Method starting at vertex D. Be sure to state the total weight of the circuit.
19. For the following graph, find a Hamiltonian circuit by using the Sorted Edges Method. Be sure to state the total weight of the circuit.

20. Consider the following order-requirement digraph.

State the critical path and the project completion time.

Create a schedule for two processors based on the order-requirement digraph and priority list below.

Priority List: T1, T2, T4, T6, T5, T3, T7