1. Based on general features which the following data sets would most likely have (skew, outliers or lack of outliers, etc.), circle all of the following which would be examples of normal distributions.

   a) asking price for all Toyota Corollas currently for sale in Arizona

   b) heights of all 4th grade children in Flagstaff

   c) salaries of all faculty and staff at a typical university

   d) ages of athletes competing in this year’s Tour de France cycling race

2. Suppose the two normal distributions pictured below approximately represent the longevity (measured in weeks) of two competing brands of automotive brake pads.

![Graph showing two normal distributions](image)

Which brand has the higher “average” longevity? Explain.

Which brand’s brake pads are “more consistent”? Explain.
3. The price of new university textbooks is normally distributed with a mean of $120 and a standard deviation of $20.
   a) Find the z-score and percentile of a textbook which costs $85.

b) Find and interpret the percentile of a textbook which costs $166.

c) What percentage of textbooks cost more than $150?

c) A publishing company advertising electronic versions of their textbooks claims that their most expensive e-book is “in the cheapest 15% of all textbooks.” How much must their most expensive e-book cost in order for this claim to be true?
4. The SAT scores for 2005 college-bound seniors in California follow an approximate normal distribution. Suppose the normal curve below has units of one standard deviation marked on its horizontal axis.

What was the mean SAT score in 2005?

Within what range were “almost all” SAT scores in 2005?

5. The age of full-time federal employees has an approximate normal distribution with a mean of 50 years and a standard deviation of 5 years.

a) What range ages are “typical” for full-time federal employees? That is, what range of ages captures the middle 68% of full-time federal employees?

b) In what range ages are “almost all” full-time federal employees? That is, what range of ages captures the middle 95% of full-time federal employees?
6. A group of student athletes are entered into a drawing at an awards banquet. There are 7 players present from the men’s basketball team, 8 from the women’s basketball team, 6 from the women’s soccer team, and 10 from the men’s football team.

If one player is chosen at random to receive a prize, what is the probability the player

is a woman?

is male or on the football team?

is a woman and on the football team?

is a woman given that she is not a soccer player?

If two players are selected at random to receive two different prizes (and the first prize-winner cannot win the second prize), what is the probability

both prize-winners are women?

the first prize-winner is a football player and the second prize-winner is a soccer player?

7. Suppose you roll a fair six-sided die twice, recording the outcome after each roll.

Define an event which would be disjoint from the event “sum of 7”.

Define an event which would not be disjoint from the event “sum of 7”.

Are the events “sum of 9” and “first roll is a 2” independent? You must provide calculations and/or an explanation to justify your answer.
8. An incomplete probability distribution is given below.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>11</th>
<th>16</th>
<th>21</th>
<th>26</th>
<th>31</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability</td>
<td>0.1</td>
<td>0.12</td>
<td>0.08</td>
<td>0.25</td>
<td></td>
<td>0.15</td>
</tr>
</tbody>
</table>

a) Fill in the missing probability to complete the distribution.

b) Find the expected value of the probability distribution.

9. A raffle is held in which 200 tickets are sold for $4 each. If the first prize is valued at $400 and the second prize is valued at $50 (and no other prizes are rewarded), find the expected winnings of a ticket holder. *When calculating probabilities, assume no tickets have been drawn.*
10. A survey of 280 attendees at a recent NAU women’s soccer game found that 168 had played on a soccer team themselves at some point.

Identify the population and sample of this survey.

Calculate the appropriate sample statistic for this survey.

Describe the sampling distribution for the statistic you just calculated.

Based on the Central Limit Theorem, what important conclusion can you make about the sampling distribution you just described.

11. During the manufacturing process, a sample of 224 digital camera lenses was inspected and 20 were found to have minor defects. Construct and interpret a 95% confidence interval for the proportion of all lenses which have minor defects.