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**Part 5.4: Mixed Questions**

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1. The age of a pine tree being cut down is between 3 and 40 years with the most common age being 28 years. The age of the tree is only known to the nearest year.
  - a. Choose a distribution to model this situation and justify your choice.
  - b. What is the probability a tree cut down is more than 30 years old?
  - c. What is the probability a tree cut down is less than 20 years old?
  - d. What is the probability a tree cut down is between 20 and 30 years old inclusive?
  - e. In order to be in the oldest 25% of trees, how old does a tree that is cut down need to be?
2. The volume of nail polish in a bottle is normally distributed with a mean of 40 mL and a standard deviation of 10 mL. They are always measured to the nearest mL.
  - a. What is the probability a bottle has less than 25 mL in it?
  - b. Calculate the probability a bottle is stated as having 19 mL in it?
  - c. What is the probability there is more than 25 mL in the bottle?
  - d. Calculate the probability there between 30 mL and 35 mL in the bottle?
  - e. What volume do the smallest 5% of bottles have in them?
3. Length of a skipping rope is known to be between 1.4 m and 3.2 m. Skipping ropes are manufactured in 20 cm increments.
  - a. Choose a distribution to model this situation and justify your choice.
  - b. What is the probability the skipping rope is more than 2 m long?
  - c. Calculate the probability the skipping rope is exactly 2.4 m?
  - d. What is the probability the skipping rope is less than 1.5 m long?
  - e. What length must a skipping rope be in order to be in the largest 15% of ropes?
4. The most common length of song in my music library is 3:27. The maximum length is 14:48 and the shortest length is 0:22. All songs lengths are displayed to the nearest second.
  - a. Choose a distribution to model this situation and justify your choice.
  - b. What is the probability a song I select is more than 3 minutes long?
  - c. What is the probability a song I select is less than 5 minutes long?
  - d. If I have 1800 songs in my library, how many are likely to be more than 10 minutes long?
  - e. What length must a song be shorter than to be in the bottom 10% of songs?