## In Exercises 1-4, determine whether the events are mutually exclusive. Explain your reasoning.

1. Event $A$ : Randomly select a college student taking a statistics course.

Event $B$ : Randomly select a college student taking an archeology course.
2. Event $A$ : Randomly select a person between 14 and 17 years old.

Event $B$ : Randomly select a person between 18 and 24 years old.
3. Event $A$ : Randomly select a person who likes cats.

Event $B$ : Randomly select a person who owns a dog.
4. Event $A$ : Randomly select a person who uses the Internet at least twice a week.

Event $B$ : Randomly select a person who has not used the Internet in 7 days.
5. Twelve-sided dice can be constructed in the shape of regular dodecahedrons such that each of the integers 1-6 appears twice on the die. Suppose two twelve-sided dice are rolled.
a. What is the probability that the sum is greater than 5 ?
b. What is the probability that the sum is not prime?
c. What is the probability that the sum is 4 or 9 or 12 ?
d. Prove that these dice can be used in any game requiring standard six-sided dice without changing the probabilities or different outcomes.
6. A box contains 36 pieces of fabric, some of which are pink and the rest of which are purple. Some of the fabric is satin and the rest is cotton. If a piece of fabric is randomly selected from the box, the probability that it is pink is $\frac{1}{4}$, that it is cotton is $\frac{7}{9}$, and that it is pink or cotton is $\frac{11}{12}$.
a. How many pieces of fabric are purple?
b. How many pieces of fabric are purple and cotton?

