

Classroom Voting Questions: Elementary Statistics

Random Variables

1. Draw the following dart board: A dart board is constructed from three concentric circles with radii 1 inch, 2 inches, and 3 inches, respectively. If a dart lands in the innermost circle, the player receives 4 points. If the dart lands between the innermost circle and the middle circle, the player receives 2 points. If the dart lands between the middle circle and the outermost circle, the player receives 1 point. Assume that the probability of a dart landing in any particular region is proportional to the area of that region.

Define the random variable X to be the sum of the player's score on two successive throws. Then X is what type of random variable?

- (a) discrete
- (b) continuous

2. Draw the following dart board: A dart board is constructed from three concentric circles with radii 1 inch, 2 inches, and 3 inches, respectively. If a dart lands in the innermost circle, the player receives 4 points. If the dart lands between the innermost circle and the middle circle, the player receives 2 points. If the dart lands between the middle circle and the outermost circle, the player receives 1 point. Assume that the probability of a dart landing in any particular region is proportional to the area of that region.

Suppose that a player's score on a single dart throw is defined to be the distance between the dart and the center of the board. Define the random variable X to be the sum of the player's score on two successive throws. Then X is what type of random variable?

- (a) discrete
- (b) continuous

3. A radioactive mass emits particles at an average rate of 15 particles per minute. Define the random variable X to be the number of particles emitted in a 10-minute time frame. Then X is what type of random variable?

- (a) discrete
- (b) continuous

4. A radioactive mass emits particles at an average rate of 15 particles per minute. A particle is emitted at noon today. Define the random variable X to be the time elapsed between noon and the next emission. Then X is what type of random variable?
- (a) discrete
 - (b) continuous
5. A randomly-selected kindergarten class in a large city will get to have a party on Friday of next week. At one point in the party, each child in the class will receive half of a candy bar. Define the random variable X to be the number of candy bars given out in the class next Friday. Then X is what type of random variable?
- (a) discrete
 - (b) continuous
6. Consider the continuous random variable $X =$ the weight in pounds of a randomly selected newborn baby born in the United States during 2006. Let f be the probability density function for X . It is probably safe to say that $P(X < 0) = 0$ and $P(X < 20) = 1$. Which of the following is *not* a justifiable conclusion about f given this information?
- (a) No portion of the graph of f can lie below the x -axis.
 - (b) The area under the entire graph of f equals 1.
 - (c) The area under the graph of f between $x = 0$ and $x = 20$ is 1.
 - (d) The nonzero portion of the graph of f lies entirely between $x = 0$ and $x = 19$.
7. Two standard, six-sided dice are rolled. What is the probability that the sum of the dice is 6?
- (a) $\frac{1}{6}$
 - (b) $\frac{5}{6}$
 - (c) $\frac{1}{12}$
 - (d) $\frac{5}{12}$
 - (e) $\frac{1}{36}$
 - (f) $\frac{5}{36}$
8. Two standard, six-sided dice are rolled. What is the most probable sum?
- (a) 2
 - (b) 6

- (c) 7
- (d) 12

9. Consider rolling a standard, six-sided die. Let A be the event that the number rolled is even. Let B be the event that the number rolled is a multiple of 3. The event $(not B)$ consists of

- (a) 1, 3, 5
- (b) 1, 2, 4, 5
- (c) 2, 4, 6
- (d) 1, 3, 5

10. Consider rolling a standard, six-sided die. Let A be the event that the number rolled is even. Let B be the event that the number rolled is a multiple of 3. The event $(A$ and $B)$ consists of

- (a) 2, 3, 4, 6
- (b) 2, 3, 4, 6, 6
- (c) 6

11. Consider rolling a standard, six-sided die. Let A be the event that the number rolled is even. Let B be the event that the number rolled is a multiple of 3. The event $(A$ or $B)$ consists of

- (a) 2, 3, 4, 6
- (b) 2, 3, 4, 6, 6
- (c) 6

12. A standard, six-sided die is rolled. What is the probability of rolling an even number or a number divisible by 3?

- (a) $\frac{2}{3}$
- (b) $\frac{5}{6}$
- (c) 4
- (d) 5

13. A card is drawn at random from a standard deck of 52 playing cards. What is the probability that the card is a red card or a jack?

(a) 28

(b) 30

(c) $\frac{7}{13}$

(d) $\frac{15}{26}$