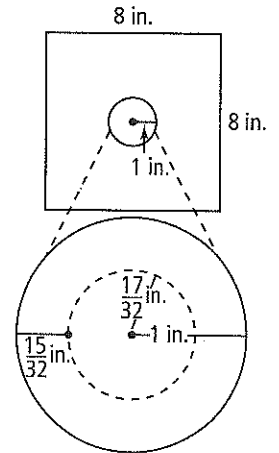


10-8 Think About a Plan

Geometric Probability

Games To win a prize at a carnival game, you must toss a quarter so that it lands entirely within a 1-in. circle as shown at the right. Assume that the center of a tossed quarter is equally likely to land at any point within the 8-in. square.



- a. What is the probability that the quarter lands entirely in the circle in one toss?
 - b. **Reasoning** On average, how many coins must you toss to win a prize? Explain.
1. In this problem, what represents the favorable outcome? Be specific.

 2. In this problem, what represents all the possible outcomes?

 3. If a section of the quarter is in the circle, does this count as a favorable outcome?

 4. How can you determine a smaller circle within which the center of the quarter must land for the quarter to be entirely within the 1-in. circle? What is the radius of this circle? The radius of a quarter is $\frac{15}{32}$ in.

 5. Use words to write a probability ratio. Then rewrite the ratio using the appropriate formulas. Substitute the appropriate measures and find the probability.

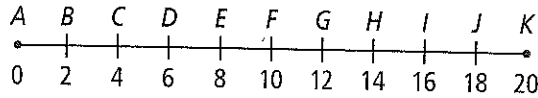
 6. Based on this, what is the average number of coins you must toss before you can expect to win a prize? Explain.

10-8 Practice

Geometric Probability

Form G

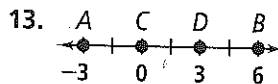
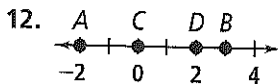
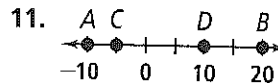
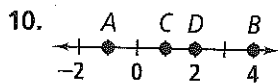
Find the probability that a point chosen at random from \overline{AK} is on the given segment.



1. \overline{CF}
2. \overline{BI}
3. \overline{GK}
4. \overline{FG}
5. \overline{AK}
6. \overline{AC}

7. Roberto's trolley runs every 45 minutes. If he arrives at the trolley stop at a random time, what is the probability that he will *not* have to wait more than 10 minutes? Draw a geometric model to solve the problem.
8. The state of Connecticut is approximated by a rectangle 100 mi by 50 mi. Hartford is approximately at the center of Connecticut. If a meteor hit the earth within 200 mi of Hartford, find the probability that the meteor landed in Connecticut.
9. A stoplight at an intersection stays red for 60 seconds, changes to green for 45 seconds, and then turns yellow for 15 seconds. If Jamal arrives at the intersection at a random time, what is the probability that he will have to wait at a red light for more than 15 seconds?

A point between A and B on each number line is chosen at random. What is the probability that the point is between C and D ?



Use the dartboard at the right for Exercises 14–16. Assume that a dart you throw will land on the dartboard and is equally likely to land at any point on the board.

14. What is the probability of hitting region X ?
15. What is the probability of hitting region Y ?
16. What is the probability of hitting region Z ?

