

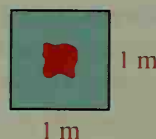
10. Repeat Exercise 9, using a nickel instead of a quarter. The radius of a nickel is 11 mm.

- B** 11. A piece of wire 6 in. long is cut into two pieces at a random point. What is the probability that both pieces of wire will be at least 1 in. long?

12. A piece of string 8 cm long is cut at a random point. What is the probability that:

- each piece is at least 2 cm long?
- the lengths of the two pieces differ by no more than 2 cm?
- the lengths of the two pieces total 8 cm?

13. Darts are thrown at a 1-meter square which contains an irregular red region. Of 100 darts thrown, 80 hit the square. Of these, 10 hit the red region. Estimate the area of this region.



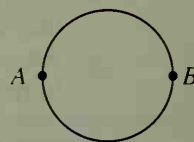
14. A carnival game has a white dartboard 5 m long and 2 m wide on which 100 red stars are painted. Each player tries to hit a star with a dart. Before trying it, you notice that only 3 shots out of the previous 50 hit a star. Estimate the area of one star.

15. a. Suppose that a coin with radius R is tossed and lands on the table shown on page 462. Show that the probability the coin does not touch a line is $\left(\frac{30 - 2R}{30}\right)^2$.

- b. Find the value of R for which the probability is 0.25.

16. A and B are the endpoints of a diameter. If C is a point chosen at random from the points on the circle (excluding A and B), what is the probability that:

- $\triangle ABC$ is a right triangle?
- $m\angle CAB \leq 30^\circ$?



- C** 17. A researcher was tape recording birdcalls. The tape recorder had a 1-hour tape in it. Eight minutes after the recorder was turned on, a 5-minute birdcall began. Unfortunately, the researcher accidentally erased 10 min of the tape. What is the probability that:

- part of the birdcall was erased?
 - all of the birdcall was erased?
- (Hint: Draw a time line from 0 to 60 min and locate on this line when the birdcall took place. Also consider the possible starting times when the erasure could have occurred.)

Challenge

Three segments through point P and parallel to the sides of $\triangle XYZ$ divide the whole region into six subregions. The three triangular subregions have the areas shown. Find the area of $\triangle XYZ$.

