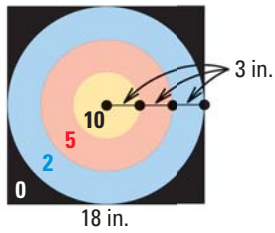
GEOMETRIC PROBABILITY Some probabilities are found by calculating a ratio of two lengths, areas, or volumes. Such probabilities are **geometric probabilities**.

EXAMPLE 5 Find a geometric probability

DARTS You throw a dart at the square board shown. Your dart is equally likely to hit any point inside the board. Are you more likely to get 10 points or 0 points?



Solution

$$P(\text{10 points}) = \frac{\text{Area of smallest circle}}{\text{Area of entire board}}$$

$$= \frac{\pi \cdot 3^2}{18^2} = \frac{9\pi}{324} = \frac{\pi}{36} \approx 0.0873$$

$$P(\text{0 points}) = \frac{\text{Area outside largest circle}}{\text{Area of entire board}}$$

$$= \frac{18^2 - (\pi \cdot 9^2)}{18^2} = \frac{324 - 81\pi}{324} = \frac{4 - \pi}{4} \approx 0.215$$

▶ Because $0.215 > 0.0873$, you are more likely to get 0 points.

Animated Algebra at classzone.com

GUIDED PRACTICE for Example 5

7. **WHAT IF?** In Example 5, are you more likely to get 5 points or 0 points?

10.3 EXERCISES

HOMEWORK KEY

- = **WORKED-OUT SOLUTIONS** on p. WS1 for Exs. 7, 17, and 39
- = **TAKS PRACTICE AND REASONING** Exs. 19, 26, 27, 32, 42, 44, and 45
- = **MULTIPLE REPRESENTATIONS** Ex. 40

SKILL PRACTICE

1. **VOCABULARY** Copy and complete: A probability that is the ratio of two lengths, areas, or volumes is called a(n) ___?___ probability.

2. **WRITING** *Explain* the difference between theoretical probability and experimental probability. Give an example of each.

EXAMPLE 1 on p. 698 for Exs. 3–16

CHOOSING NUMBERS **You have an equally likely chance of choosing any integer from 1 through 50. Find the probability of the given event.**

3. An even number is chosen.
4. A number less than 35 is chosen.
5. A perfect square is chosen.
6. A prime number is chosen.
7. A factor of 150 is chosen.
8. A multiple of 4 is chosen.
9. A two-digit number is chosen.
10. A perfect cube is chosen.