LESSON 11.6

NAME _____ DATE _____

Reteaching with Practice

For use with pages 699–705

GOAL Find a geometric probability

VOCABULARY

A **probability** is a number from 0 to 1 that represents the chance that an event will occur.

Geometric probability is a probability that involves a geometric measure such as length or area.

Probability and Length Let $\overline{AB}$ be a segment that contains the segment $\overline{CD}$. If a point K on $\overline{AB}$ is chosen at random, then the probability that it is on $\overline{CD}$ is as follows:

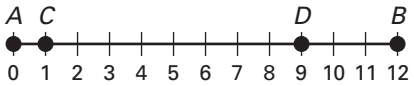
$$P(\text{Point } K \text{ is on } \overline{CD}) = \frac{CD}{AB} = \frac{\text{Length of } \overline{CD}}{\text{Length of } \overline{AB}}$$

Probability and Area Let J be a region that contains region M. If a point K in J is chosen at random, then the probability that it is in region M is as follows:

$$P(\text{Point } K \text{ is in region } M) = \frac{\text{Area of } M}{\text{Area of } J}$$

EXAMPLE 1 Finding a Geometric Probability

Find the probability that a point chosen at random on $\overline{AB}$ is on $\overline{CD}$.



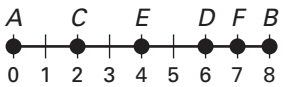
SOLUTION

$$P(\text{Point is on } \overline{CD}) = \frac{\text{Length of } \overline{CD}}{\text{Length of } \overline{AB}} = \frac{8}{12} = \frac{2}{3}$$

The probability can be written as $\frac{2}{3}$, or approximately 0.667, or 66.7%.

Exercises for Example 1

In Exercises 1–4, find the probability that a point *A*, selected randomly on $\overline{AB}$, is on the given segment.



1. $\overline{CD}$ **2.** $\overline{EF}$

3. $\overline{CF}$ **4.** $\overline{CE}$

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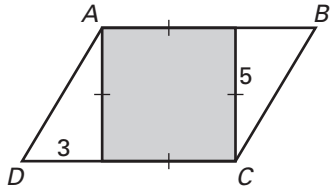
EXAMPLE 2 Using Areas to Find a Geometric Probability

Find the probability that a point chosen at random in parallelogram *ABCD* lies in the shaded region.



SOLUTION

Find the ratio of the area of the shaded square to the area of the parallelogram.

$$P(\text{point is in shaded region}) = \frac{\text{Area of shaded region}}{\text{Area of parallelogram}}$$

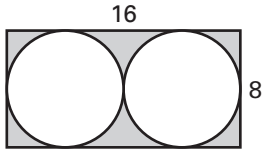
$$= \frac{s^2}{bh} = \frac{5^2}{8(5)} = \frac{25}{40} = \frac{5}{8} = 0.625$$

The probability that a point chosen at random in parallelogram *ABCD* lies in the square is 0.625.

Exercises for Example 2

Find the probability that a point chosen at random in the figure lies in the shaded region.

5.



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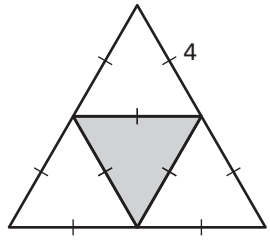

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