

Geometry

11.6 Use Geometric Probability

Probability

$$\text{Probability} = \frac{\text{Outcomes}}{\text{Outcomes}}$$

Let's say you are listening to a radio contest where you hear a song and call in and name it. The song was supposed to be played between 12:00 and 1:00, but you can only listen from 12:20 to 1:00 because that is when you get out of class. What is the probability that you will hear the song?

Length Probability Postulate

If a point on AB is chosen at _____ and C is between A and B, then the _____ that the point is on _____ is

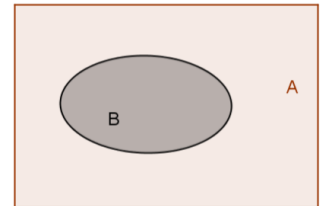
$$P(AC) = \frac{\text{Length of } AC}{\text{Length of } AB}$$



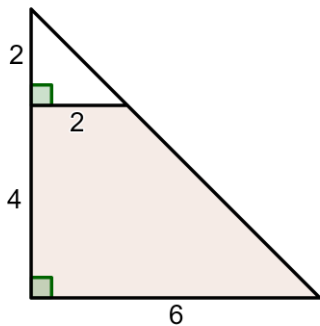
Area Probability Postulate

If a point in region A is chosen at _____, then the probability that the _____ is in region _____, which is in the _____ of region A, is $\frac{\text{Area of region } B}{\text{Area of region } A}$.

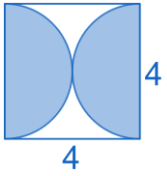
$$P(B) = \frac{\text{Area of } B}{\text{Area of } A}$$



Find the probability that a random point is in the shaded region.



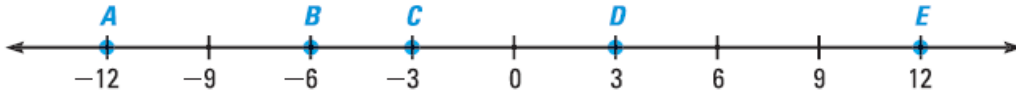
Find the probability that a random point is in the shaded region.



Assignment: Attached worksheet

Assignment:

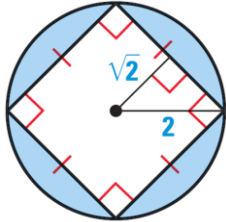
Find the probability that a point K , selected randomly on \overline{AE} , is on the given segment. Express your answer as a fraction, decimal, and percent.



1. \overline{BC}

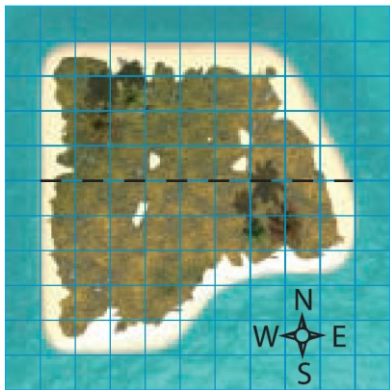
2. \overline{AE}

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



3.

Use the scale drawing.



5. What is the approximate area of the north side of the island? The south side of the island? The whole island?
6. Find the probability that a randomly chosen location on the island lies on the south side.

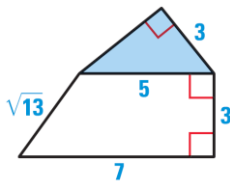
Find the probability that a point chosen at random on the segment satisfies the inequality.



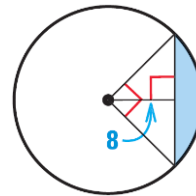
7. $x - 6 \leq 1$

8. $\frac{x}{2} \geq 7$

Find the probability that a randomly chosen point in the figure lies in the shaded region. *Explain your steps.*

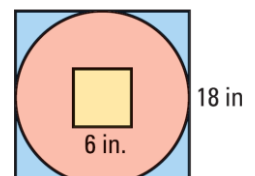


9.

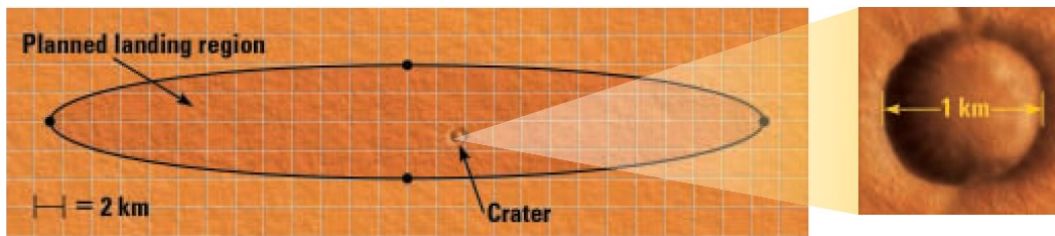


10.

11. A sector of a circle intercepts an arc of 80° . Find the probability that a randomly chosen point on the circle lies on the arc. Find the probability that a randomly chosen point in the circle lies in the sector. *Explain* why the probabilities do not depend on the radius.
12. A dart is thrown and hits the target shown. If the dart is equally likely to hit any point on the target, what is the probability that it hits inside the inner square? That it hits outside the inner square but inside the circle?



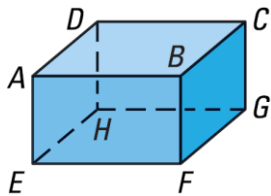
13. Suppose that your school day is from 8:00 A.M. until 3:00 P.M. You eat lunch at 12:00 P.M. If there is a fire drill at a random time during the day, what is the probability that it begins before lunch?
14. Scientists lost contact with the space probe Beagle 2 when it was landing on Mars in 2003. They have been unable to locate it since. Early in the search, some scientists thought that it was possible, though unlikely, that Beagle had landed in a circular crater inside the planned landing region. The diameter of the crater is 1 km.



- a. In the scale drawing, each square has side length 2 kilometers. Estimate the area of the planned landing region. *Explain* your steps.
 - b. Estimate the probability of Beagle 2 landing in the crater if it was equally likely to land anywhere in the planned landing region.
15. A 6 inch long rope is cut into two pieces at a random point. Find the probability both pieces are at least 1 inch long.

Mixed Review

Think of each segment shown as part of a line.



16. Name the intersection of plane DCH and plane ADE .

17. Name a plane that appears to be parallel to plane ADH .

Find the area of the polygon.

