Name:_____ Date:_____ Block:_____

M217 Geometry

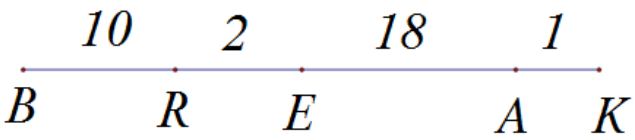
Section 9-6: Geometric Probability

Geometric probability is …. **The probability of an event based on a ratio of geometric measures (such as length or area)**

We have three different models

1) **Using Length**

Let's say that I randomly choose a point on the line below.



a. *What is the probability the point is on $\overline{BR}$?*

The probability is $\frac{10}{31} \approx .3226$

b. *What is the probability the point is NOT on $\overline{BR}$?*

The probability is $\frac{2+18+1}{31} = \frac{21}{31} \approx 0.6774$ *or 1-0.3226= 0.6774*

c. *What is the probability the point is on $\overline{RA}$?*

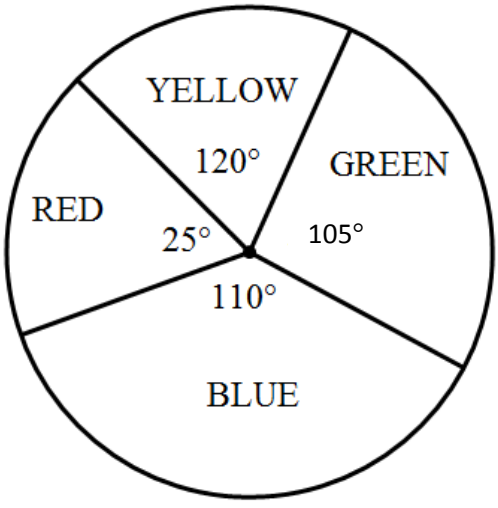
The probability is $\frac{2+18}{31} = \frac{20}{31} \approx 0.6452$

d. *What is the probability the point is NOT on $\overline{RA}$?*

The probability is $\frac{10+1}{31} = \frac{11}{31} \approx 0.3548$ *or 1-0.6452=0.3548*

2) ***Using Angle Measure***

Let's say I have a spinner like the one below…



1. *Which color is more likely the spinner to land on?*

   YELLOW

2. *Which color is the spinner least likely to land on?*

   RED

3. *Find the probability the spinner lands on BLUE?*

   $\frac{110°}{360°} = \frac{11}{36} \approx 0.3055$

4. *Find the probability the spinner lands on YELLOW or RED?*

   $\frac{120° + 25°}{360°} = \frac{145}{360} = \frac{29}{72} \approx 0.4028$

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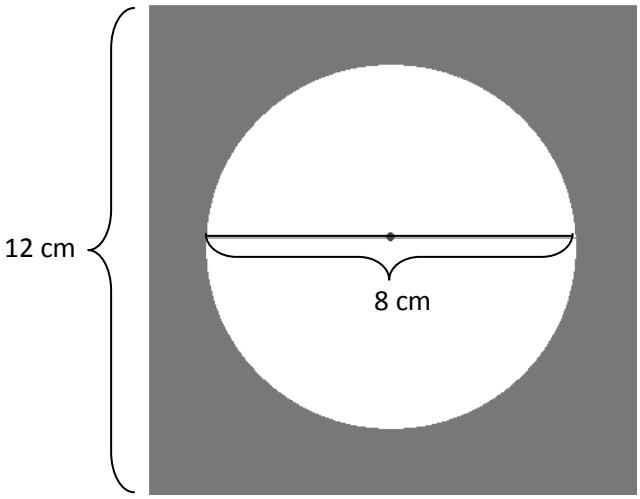
3) Using Area to find probability

1) Let's say I throw a dart at the image below. Let's say I hit somewhere inside the square….



a) What is the area of the circle?

$A = \pi r^2 = \pi(4)^2 = 16\pi\ cm^2 \approx 50.27\ cm^2$

b) What is the area of the square?

$A = bh = 12 * 12 = 144\ cm^2$

c) What is the area of the shaded region?

$A = Square - Circle$

$= 144\ cm^2 - 16\pi\ cm^2$

$\approx 93.73\ cm^2$

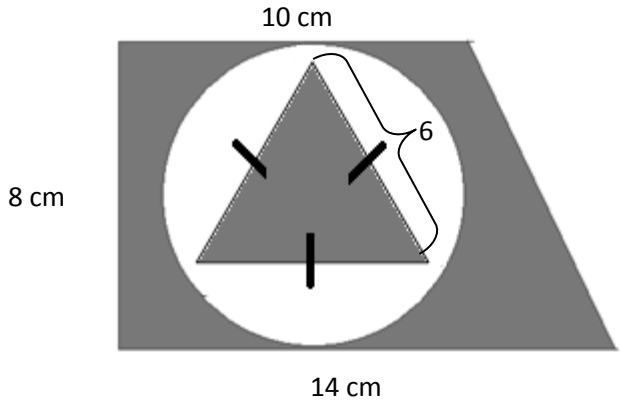
d) What is the probability of the dart landing in the circle?

$\frac{50.27}{144} \approx 0.3491$

e) What is the probability of landing in the shaded region?

$\frac{93.73}{144} \approx 0.6509$

2) Let's say I throw a dart at the image below. Let's say I hit somewhere inside the trapezoid…



a) What is the area of the trapezoid

$A = \frac{1}{2}(b1 - b2)h = \frac{1}{2}(10 + 14) * 8 = \frac{1}{2}(24)(8)$

$= \frac{192}{2} = 96cm^2$

b) What is the area of the circle?

$A = \pi r^2 = \pi(4)^2 = 16\pi\ cm^2 \approx 50.27\ cm^2$

c) What is the area of the Equilateral Triangle?

$A = \frac{s^2\sqrt{3}}{4} = \frac{(6)^2\sqrt{3}}{4} = \frac{36\sqrt{3}}{4} cm^2 \approx 15.59\ cm^2$

d) What is the probability of the dart landing in the shaded region?

$A = Trap - \odot + \Delta = 96 - 50.27 + 15.59 = 61.323\ cm^2$

$probability = \frac{61.323}{96} \approx 0.6388$

e) What is the probability of the dart landing in the equilateral triangle?

$probability = \frac{15.59}{96} \approx 0.1624$

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PRACTICE PROBLEMS

A point is randomly chosen on $\overline{AD}$. Find the fractional probability of each event.

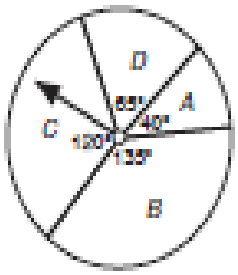
1. The point is on $\overline{AB}$. $\frac{5}{12}$

2. The point is on $\overline{BD}$. $\frac{7}{12}$

3. The point is on $\overline{AD}$. 1

4. The point is not on $\overline{BC}$. $\frac{2}{3}$

Use the spinner to find the fractional probability of each event.



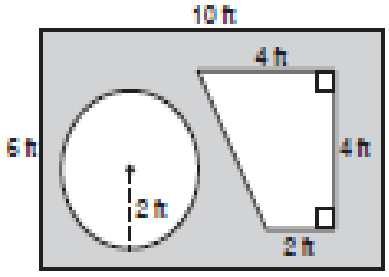
5. the pointer landing in region C $\frac{1}{3}$

6. the pointer landing in region A $\frac{1}{9}$

7. the pointer not landing in region D $\frac{59}{72}$

8. the pointer landing in regions A or B $\frac{35}{72}$

Find the probability that a point chosen randomly inside the rectangle is in each given shape. Round answers to the nearest hundredth.



9. the circle 0.21

10. the trapezoid 0.20

11. the circle or the trapezoid 0.41

12. not the circle and the trapezoid 0.59