Name: _____

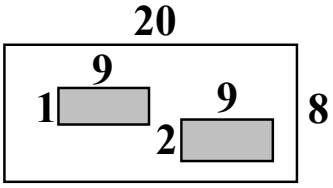
Geometric Probability

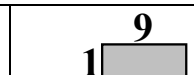
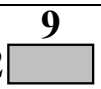
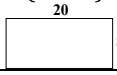
Up to this point, we have determined the probability of events, based solely on lists of information. Geometric probability is the probability of choosing a point at random from a specific area of space. Basically, it works like this:

$$Geomtric\ Probabilty = \frac{(Area\ of\ shape\ that\ I)\ WANT}{(Area\ of\ outer\ shape, which\ is\ the)\ TOTAL}$$

First, we are going to practice determining area, as we will need that to determine probability.

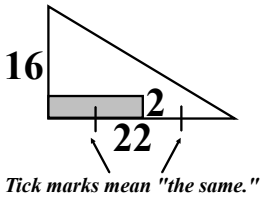
EXAMPLE: What is the probability that a randomly selected point will be in the shaded part(s)? What is the probability of the complement?



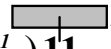
Sample Space			The rest of the outer shape (the big rectangle)
Amount (Area)	$bh = (9)(1) = 9$	$bh = (9)(2) = 18$	$total - (rect's) = 160 - (9 + 18) = 133$
Sample Size (Total) 	$bh = (20)(8) = 160$	$\leftarrow same = 160$	$\leftarrow same = 160$
Probability	$\frac{9}{160}$	$\frac{18}{160} = \frac{9}{80}$	$\frac{133}{160}$

$P(Rectangle1\ or\ Rectangle\ 2) = \boxed{\frac{27}{160}}$ $\quad$ $P(NOT\ Rectangle1\ or\ Rectangle\ 2) = \boxed{\frac{133}{160}}$

EXAMPLE: What is the probability that a randomly selected point will be in the shaded part(s)? What is the probability of the complement?

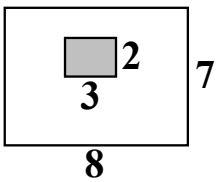


Tick marks mean "the same." So, each of these pieces have to be the same, & 11 + 11 = 22

Sample Space	 (*must be 11 to be the same*) 11	The rest of the outer shape (the big triangle)
Amount (Area)	$bh = (11)(2) = 22$	$total - rectangle = 176 - (22) = 154$
Sample Size (Total) 	$\frac{bh}{2} = \frac{(16)(22)}{2} = 176$	$\leftarrow same = 176$
Probability	$\frac{22}{176} = \frac{11}{88} = \frac{1}{8}$	$\frac{154}{176} = \frac{7}{8}$

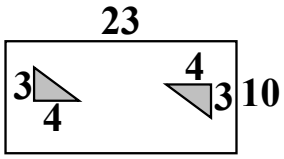
$P(Rectangle) = \boxed{\frac{1}{8}}$ $\quad$ $P(NOT\ Rectangle) = \boxed{\frac{7}{8}}$

1. What is the probability that a randomly selected point will be in the shaded part(s)? What is the probability of the complement?



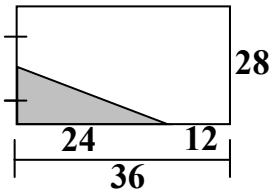
Sample Space		The rest of the total figure
Amount (Area)		
Sample Size 		
Probability		

2. What is the probability that a randomly selected point will be in the shaded part(s)? What is the probability of the complement?



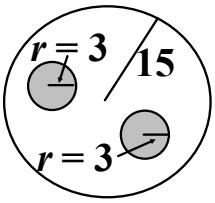
Sample Space			
Amount (Area)			
Sample Size			
Probability			

3. What is the probability that a randomly selected point will be in the shaded part(s)? What is the probability of the complement?



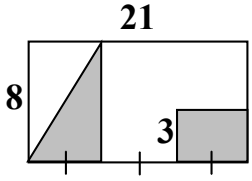
Sample Space			
Amount (Area)			
Sample Size			
Probability			

4. What is the probability that a randomly selected point will be in the shaded part(s)? What is the probability of the complement? (Use the area in terms of pi.)

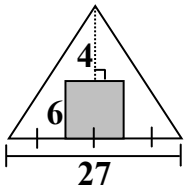


Sample Space	$r = 3$	$r = 3$	
Amount (Area)	$\pi r^2 =$	$\pi r^2 =$	
Sample Size			
Probability			

5. What is the probability that a randomly selected point will be in the shaded part(s)? What is the probability of the complement?



6. What is the probability that a randomly selected point will be in the shaded part(s)? What is the probability of the complement?



Geometric Probability Answers

1. $\frac{3}{28}$	2. $\frac{6}{115}$	3. $\frac{1}{6}$
4. $\frac{2}{25}$	5. $\frac{7}{24}$	6. $\frac{2}{5}$