

8.3 –B- Geometric Probability

In any random experiment there are two types of random variables:

Discrete Random Variable: **Continuous Random Variable:**

If it cannot take on all the possible values of an interval of real numbers.

Ex.: We roll two dice and observe the outcome.

We are interested in the **sum of the two outcomes.**

If it can take on all the possible values of an interval of real numbers.


Ex.: We randomly choose a checkout in a grocery store.

We are interested in the **waiting time** for the people in line.

1

Geometric Probability

There are 3 types of geometric probabilities, one for each of the commonly used dimensions of space; **length**, **area** and **volume**.

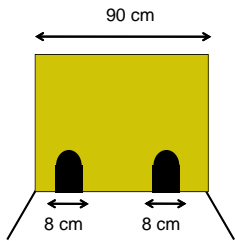
1D $P(\text{Target}) = \frac{\text{Target length}}{\text{Total length}}$ 

2D $P(\text{Target}) = \frac{\text{Target area}}{\text{Total area}}$ 

3D $P(\text{Target}) = \frac{\text{Target volume}}{\text{Total volume}}$ 

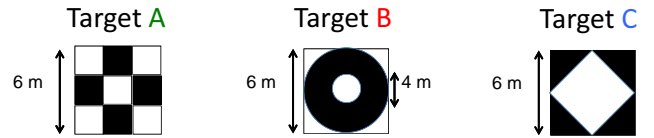
2

Ex 1: What is the probability that the blind mouse will escape into a hole?



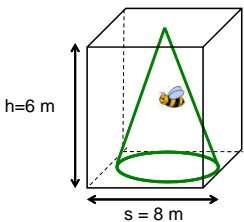
$$P(\text{Target}) = \frac{\text{Target length}}{\text{Total length}}$$

Ex 2: Which black target is a skydiver most likely to land on?



4

Ex 3: What is the probability the bee is in the laser cone?



Ex 4: The NUT HOUSE factory has two types of containers, a square base prism and a cylinder. Each hour they package 20 of the prism and 25 of the cylinder. Between 2 pm and 3 pm, they had some problem with their machine and lost one of their bolts in one of the containers. What is the probability that it fell in a cylinder container?

