

Name: KEY

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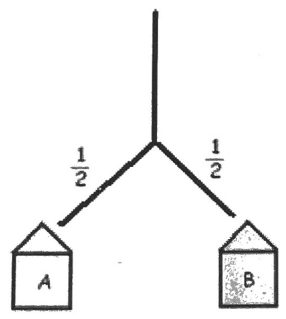
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**Probability: Determining Probabilities**  
Pre-Activity Sheet 3: Introduction to Area Models

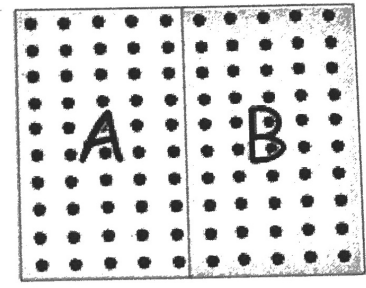
In probability, an **area model** is another way to visually represent the probability of an event. See the example below.

Suppose 100 people walk down a garden path that leads to a fork. Those who turn left go to house A, those who turn right to house B. Assume that there is a 50% - 50% chance that a person will turn one way over the other.

**Tree Diagram**



**Area Model**



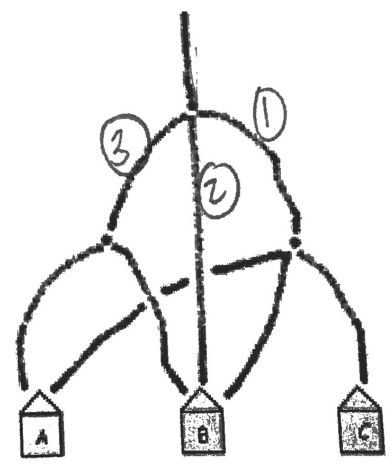
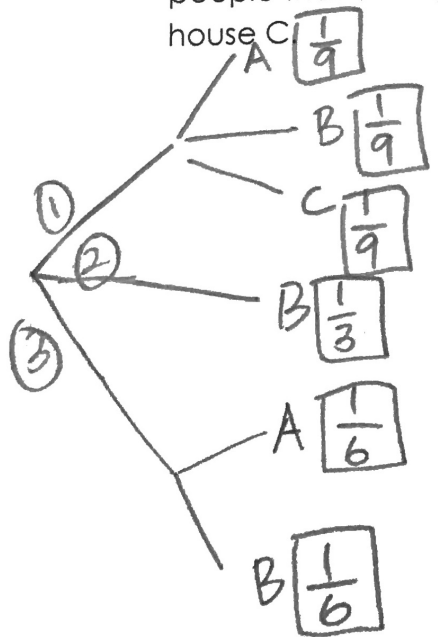
In the tree diagram set up we'd expect, essentially, 50 people to end up at house A and 50 people at house B. The diagram on the right of one-hundred dots (for 100 people) also depicts this outcome.

The number 100 in the area model is unimportant. The point is that if a square is used to denote the entire population of people walking down the path, then half the area of the square, half the people, is designated by result A and the second half of the square with result B.

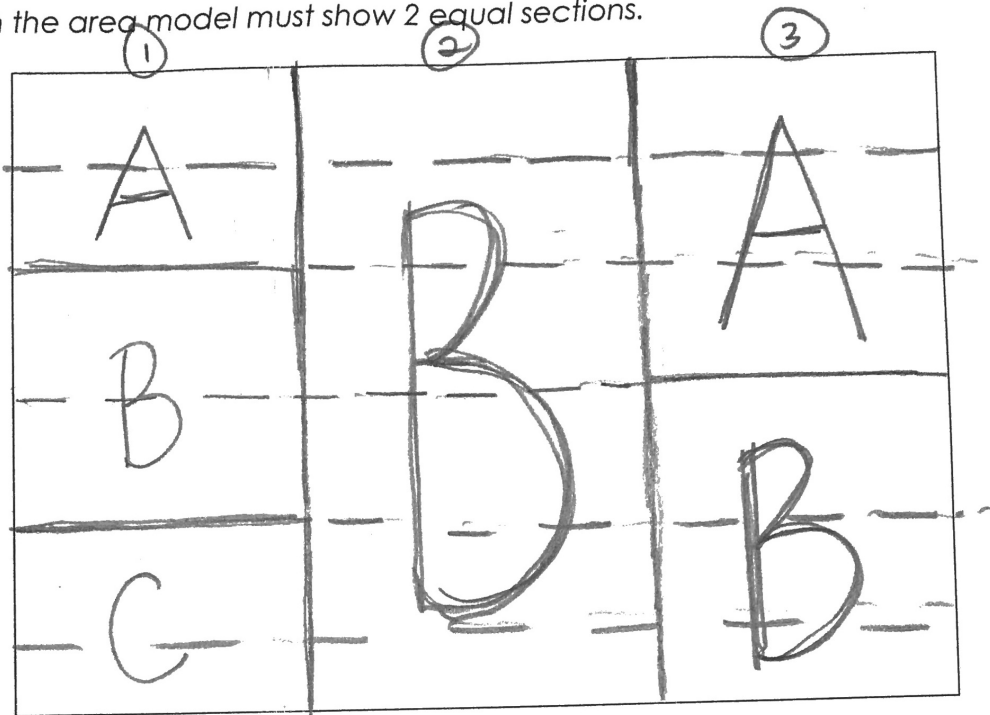
**You try!**

1. You and your friends walk down the following system of paths.

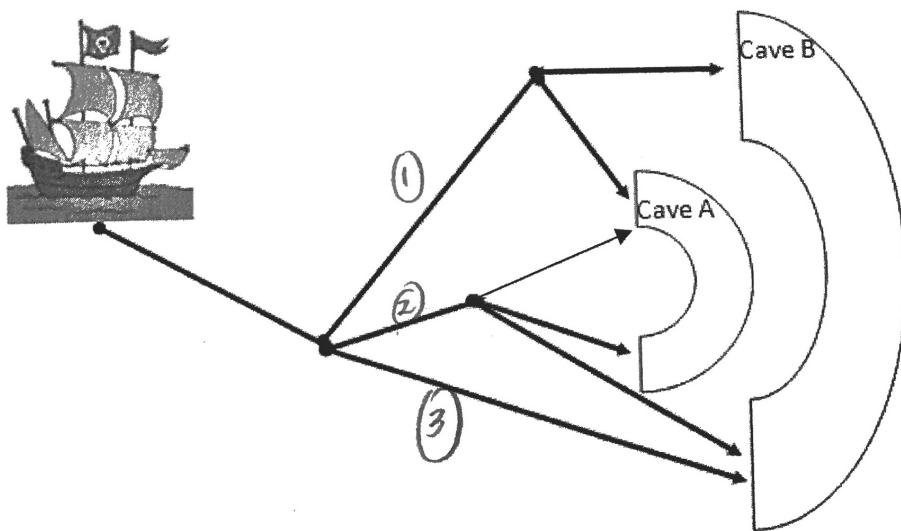
a) Create a tree diagram that shows the probabilities of people that end up at house A, at house B, and at house C

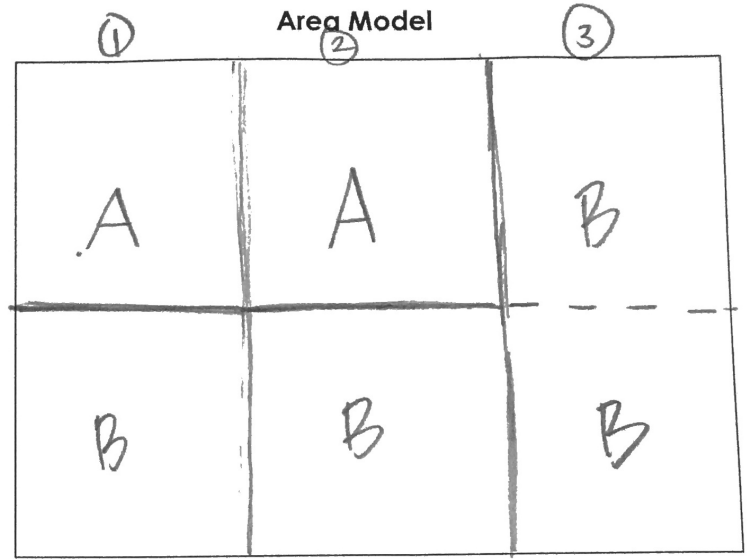
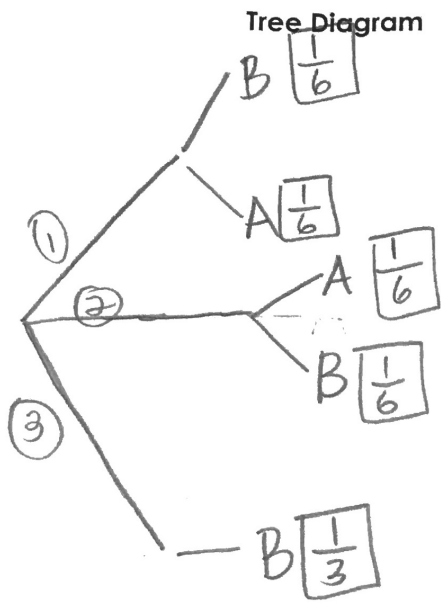


- b) Create an area model that shows the probabilities of people that end up at house A, at house B, and at house C. Remember, an area model must have equal sections for each total number of paths. For example, if one path has 2 options of roads to take, then the area model must show 2 equal sections.

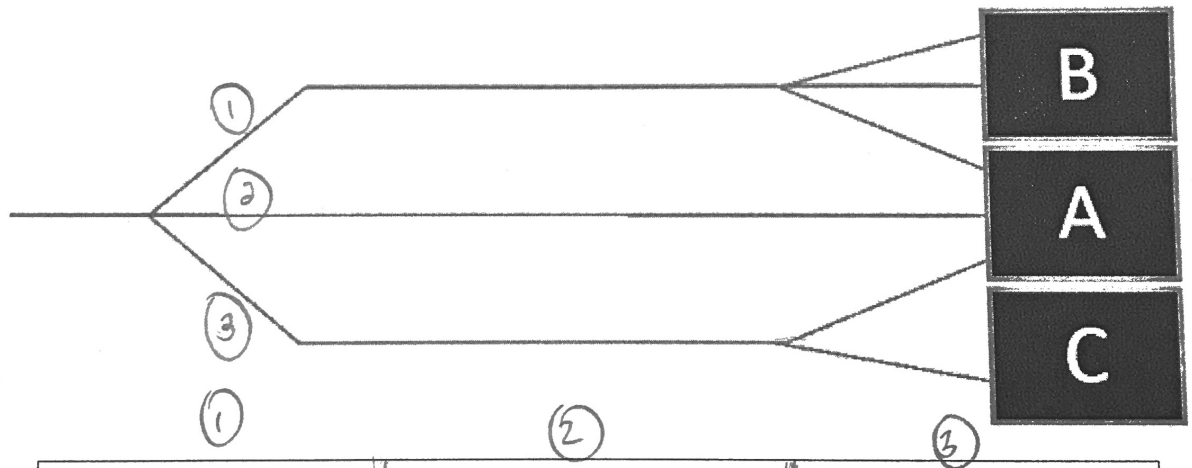


2. On Pirate Island, Ms. Baird will be hiding her treasure in either cave A or in cave B. She has tried to make her treasure as difficult as possible to find. Create both a tree diagram and an area model that represents all the possible paths the ship can take to try to find the treasure.



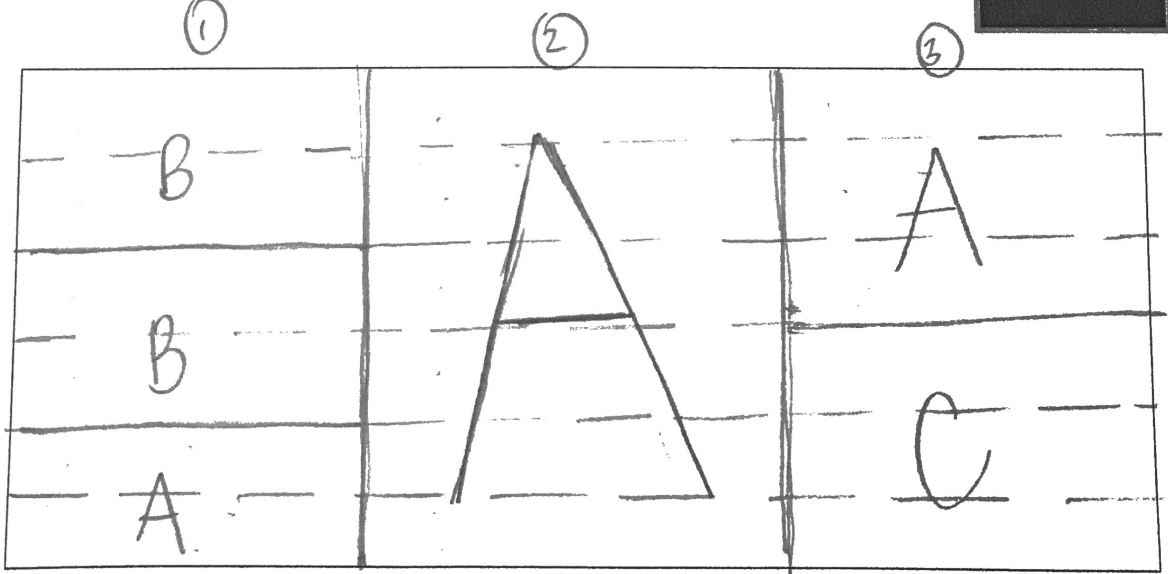


3. Assume that at each branch point in the "maze" below any branch is equally likely to be chosen and branches are independent of each other. Create an area model and use it to determine the probability of entering room A. (Hint: the answer is not 1/3, 1/2, or 3/anything).



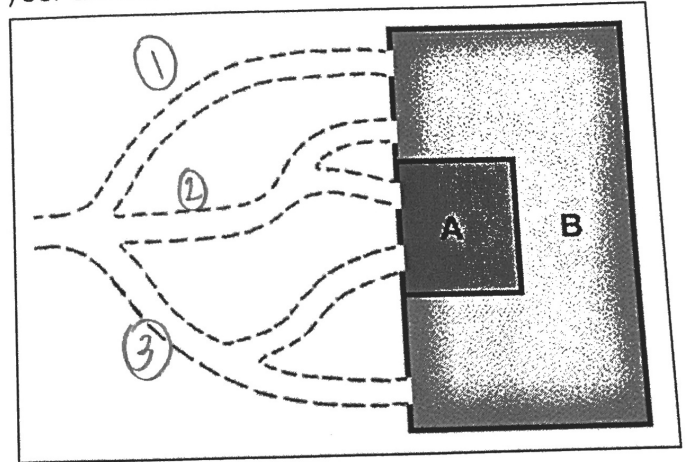
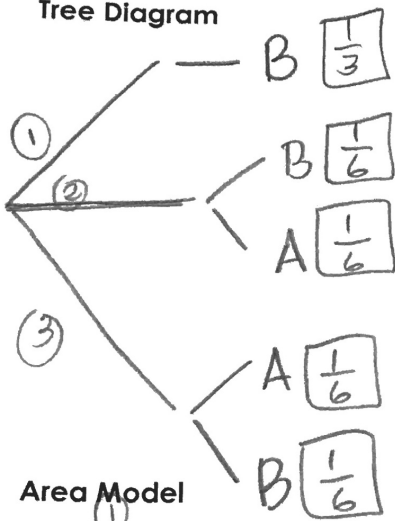
$\frac{11}{18}$

or  
61.1%

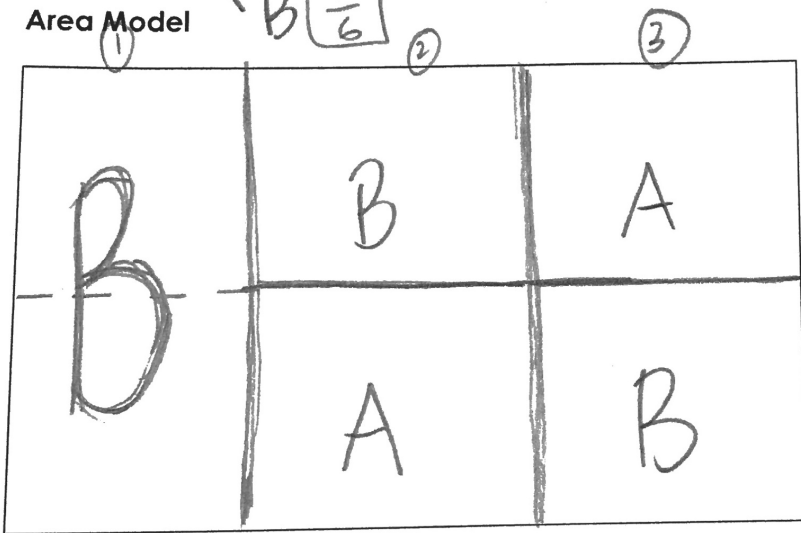


4. Use the maze to find the probability of landing on section A and section B. Use an area model and tree diagram to show how you arrived at your answer.

Tree Diagram



Area Model



5. Now, create an area model for the pumpkin maze.

