

## 1 Candy Bag Probability

You have 3 Tootsie Rolls, 8 pieces of candy corn, and 5 Jolly Ranchers in your trick-or-treat bag.

1. If you reach into the bag, what is the probability you will select a Tootsie Roll?
2. How many candies must you pick from your bag to make sure that you have at least one piece of candy corn and at least one Jolly Rancher?

## 2 Witch's Spells

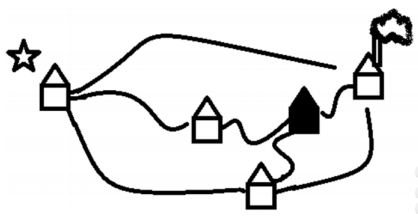
The witch Parthrikar is practicing spells that can turn one creature into another:

Mouse  $\rightarrow$  Bat  
 Cat  $\rightarrow$  Rat  
 Spider  $\rightarrow$  Raven  
 Bat  $\rightarrow$  Cat  
 Raven  $\rightarrow$  Mouse  
 Rat  $\rightarrow$  Mouse

1. Using only the given spells, how many different creatures can she turn a cat into?
2. What additional spell would help her to turn any creature into any other through a series of spells?  
 (Hint: Draw a picture)

## 3 Witch Stew

Here is a map of some streets and houses.



1. The witch Ambali lives at the house with the star, and she knows the house with the chimney has the best ingredients for her magic potion. Her magic broomstick is broken, and must walk along the streets to get to the chimney house. How many different paths can she take from his house to the chimney house without revisiting a house or a street?
2. Ambali actually has to pick up her witch friend, Sheremy, who lives at the black house first. How many different paths to the chimney house can he take now?

## 4 Challenge Problems

1. Solve the following cryptarithm (each letter represents a different number from 0 to 9).

$$\begin{array}{r} \text{G H O S T} \\ + \text{G H O S T} \\ \hline \text{H O U S E} \end{array}$$

G= , H= , O= , S= , T= , U= , E=

2. A trickster gets to your candy! First they took a third of your candy before putting 10 pieces that they didn't like back. But then they took all your remaining 90 pieces of candy anyway. How much candy did you have to begin with?
3. Another trickster comes along. They start out with half the amount of candy as your friend Bob, but they take a third of Bob's candy, and then give you 15 pieces. Now Bob and the trickster have the same amount of candy. How much did the trickster and Bob start out with?
4. Two groups of trick or treaters go into a neighborhood with a row of 51 houses. One group starts on the left and visits every 6th house while another group starts on the right and visits every 8th house. Will they ever meet? If so, at which house?
5. What is the biggest number of pieces you can get if you cut a round pumpkin pie using 3 straight cuts?
6. Can you draw a ghostly shape that you can cut into four parts using only one cut? Draw the shape and cut.
7. Courtney is trying to figure out a costume to wear tonight. She needs to pick one shirt and one pair of pants. In her closet she has a black, a blue, a green, and a white shirt. She also has white, black, and blue pants. How many different costumes can Courtney make?
8. 5 friends went trick-or-treating together for Halloween. Later the friends met up to exchange candy so that each could have their favorites. Given the following clues, can you figure out who wore what costume, and what each person's favorite candy is? (Hint: Making charts will help!)

**Friends:** Andy, Jane, Max, Pam, Samuel

**Costumes:** witch, vampire, mummy, cat, skeleton

**Candy:** Reese's, Skittles, Snickers, Starburst, Milky Way

- The 5 friends are: Max, the witch, the girl who likes Starburst, the boy who dressed as a mummy, and Andy.
- The skeleton is a boy and does not like Reese's.
- Pam is not a witch or a vampire.
- Max likes Reese's
- The mummy likes Milky Way
- The witch does not like Skittles