

# Happy Halloween

October 29, 2017

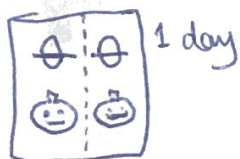
## Part I

### Preparing for Halloween!

1. 2 boys carve 2 pumpkins in 1 day. How many pumpkins will the 2 boys carve in 10 days?

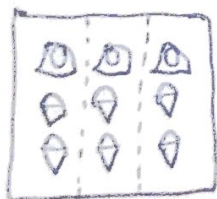
1 boy carves 1 pumpkin in 1 day  
2 boys carve 20 pumpkins in 10 days

20 pumpkins



2 boys : 2 pumpkins : 1 day  
2 boys : 20 pumpkins : 10 days

2. 3 girls decorated 6 Halloween cakes in 1 day. How long will it take 12 girls to decorate 24 Halloween cakes?



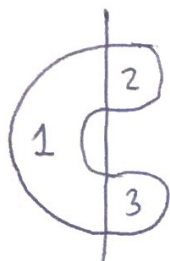
1 day

1 girl : 2 cakes : 1 day  
12 girls : 24 cakes : 1 day

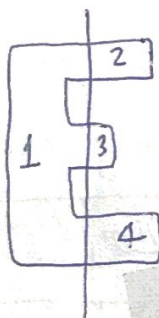
1 day

3. Can you bake a cake in a shape that you can cut into 3 parts by making a single cut?

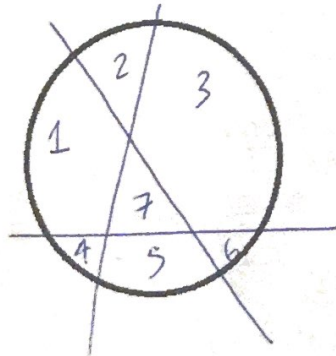
(a) Draw the shape and the cut.



(b) Can you bake a cake and cut it into 4 parts with a single cut? Draw the shape and show the cut.



4. What is the biggest number of pieces you can get if you cut around pumpkin pie using 3 straight cuts? 7 pieces



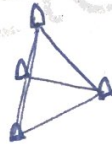


5. A couple of your friends and you decide to go to a graveyard to prepare for the fun of Halloween. Can 4 **Tombstones** in a graveyard be equal distance from each other if:

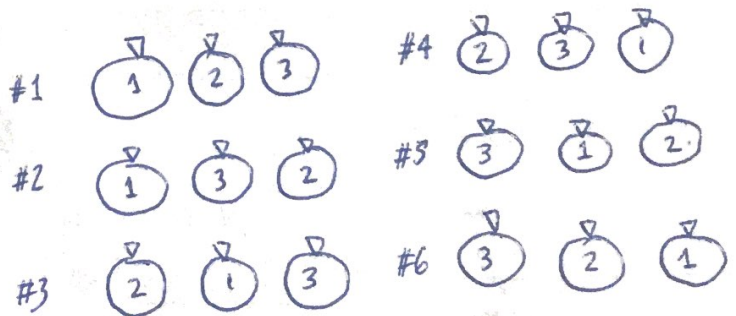
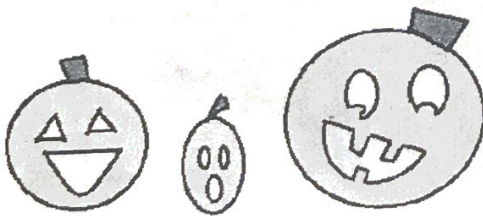
(a) They are in a line? **No**

(b) They are on flat ground? **No**

(c) They are on a hill? **Yes, if you arrange them in a triangular pyramid where all the faces are equilateral triangles.**



6. Below are 3 pumpkins that **Courtney** carved.



She gave them to **Igor** who wants to arrange them in a row in front of his house. How many different ways could **Igor** arrange these **pumpkins** in a row?

**6 different ways**

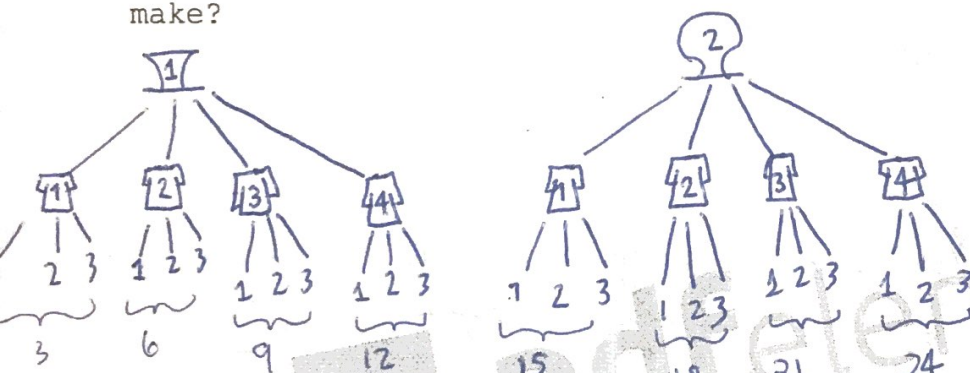


7. How many ways could Igor arrange the three pumpkins in a row if two of the three pumpkins look identical?



3 different ways

8. Chynna is trying to figure out a costume to wear tonight, which will consist of one **hat**, one **shirt**, and one pair of **pants**. If she has a choice of 2 hats, shirts, and 3 pairs of pants, how many different **costumes** could Chynna make?



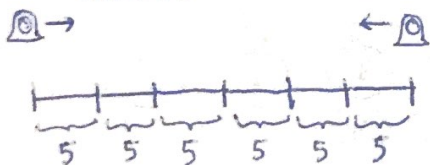
24 different costumes

Part II

## Halloween Night!

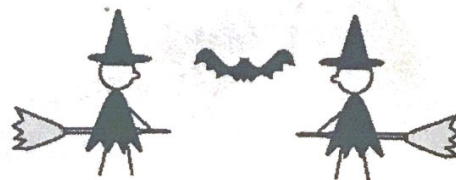
1. **CHALLENGE:** Two witches fly towards each other starting 30 miles apart, both at 5 miles per hour.

- (a) How soon will they meet?



They meet in  
3 hours

$$(3 \times 5 = 15 \rightarrow 15 + 15 = 30 \rightarrow 30 - 30 = 0)$$



- (b) While the **witches** were flying, bat circles around with the speed of 25 miles per hour. How much distance does the bat travel by the time the witches meet?

$$3 \times 25 = \underline{75 \text{ miles}}$$

2. Casper the Ghost is exactly 300 years older than Jasper the Ghost.  
Jasper became a ghost on October 31st, 1912.  $\rightarrow$  1917

(a) How old is Casper and Jasper in present day 2017?

|                         |  |
|-------------------------|--|
| Jasper is 105 years old | $\rightarrow$ (100 years old after correction) |
| Casper is 405 years old | $\rightarrow$ (400 years old after correction) |

Jasper is 100  
Casper is 400

(b) How many times older is Casper compared to Jasper in present day 2017?

Casper is 4 times older than Jasper

$$4 \times 100 = 400$$

(c) When will Casper be twice as old as Jasper?

In 200 years, Jasper will be 300 and Casper will be 600

In 2017, +200

$$J = 100$$

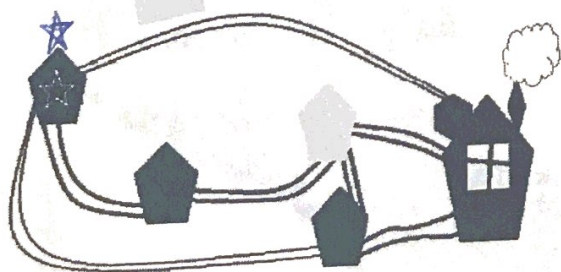
$$C = 400$$

In 2217,

$$J = 300$$

$$C = 600$$

3. Here is a map of some streets and houses.



(a) How many different paths could Ashin take from his house (with the star) to the big spooky house (with the chimney), without re-visiting a house or a street?

5 different paths



- (b) **Ashin** is too afraid to go to the spooky house alone, so he needs to stop by **Chynna's** house (the grey one) on the way so that **Chynna** can join him. How many different paths can he take now (again without re-visiting a house or street) ?

3 different paths

### Part III

## Halloween Aftermath



1. After going trick-or-treating, Courtney, has a big bag of Skittles. She puts 10 green and 10 red Skittles into a bag, and lets Igor pick some out.

- (a) If Igor picks 1 skittle out of the bag, how is it that he will pick out a green skittle? (Hint: Write your answer as a fraction, where the bottom number is the total number of skittles.)

$$\frac{10}{20} \Rightarrow 50\% \text{ chance of picking a green skittle.}$$

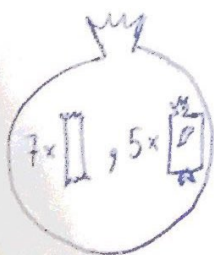
- (b) If Igor picks 1 skittle out of the bag, how likely is it that he will pick out a red skittle?

$$\frac{10}{20} \Rightarrow 50\% \text{ chance of picking a red skittle.}$$

2. Chynna has 7 plain chocolate bars and 5 chocolate bars with almonds. She puts them into a bag and lets Ashin pick some out.

- (a) If Ashin picks 1 chocolate bar out of the bag, how likely is it that he will not pick a plain chocolate bar?

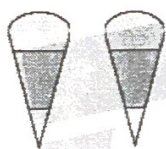
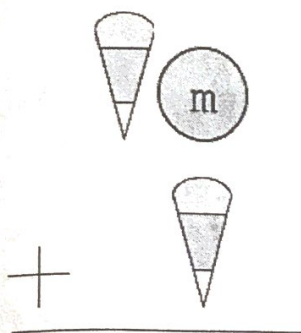
$$\frac{5}{12} \Rightarrow 41.6\% \text{ chance of not picking a plain chocolate bar.}$$



(b) If Ashin picks 1 chocolate bar out of the bag, how likely is it that he will not pick a chocolate bar with almonds?

$$\frac{7}{12} \Rightarrow 58.3\% \text{ chance of not picking a chocolate bar with almonds}$$

3. Try This!



What number does the candy corn represent?

The candy corn can be any digit  $(1, 2, 3, \dots, 9)$

What number does the M&M represent?

The M&M must be  $= 0$



(2017)

4. I was so happy that Halloween was on a Wednesday this year. What day of the year will it be on next year? When is the next year it will be on a Wednesday?

- It will be on a Thursday (assuming no leap years), in 2018
- It will be on a Wednesday again in 7 years (assuming no leap years) (2024)
- Assuming leap year, it will be on a Wednesday again in 6 years; 2023

5. Courtney has to apologize to Igor because she has been keeping a secret from him. She really really really wanted all of his candy but was too nervous to take it all at once because Igor would find out. First, she took a third of his candy. Then, she put 10<sup>5</sup> pieces back. Then, Igor came along and ate 5 pieces of his candy. Finally, Courtney got hungry again and took all the remaining candy which was 90 pieces! How much candy does Courtney have to apologize to Igor for eating? How much candy did Igor on Halloween in total?

↑ get



Igor ate 5 pieces  
Courtney ate 130 pieces  
 $130 + 5 = 135 = \text{total}$

Igor had a total of 135 candies

Igor has:  $x$

then:  $x - \frac{x}{3} = \frac{2x}{3}$

then:  $\frac{2x}{3} + 5$

then:  $\frac{2x}{3} + 5 - 5 = \frac{2x}{3}$

→  $\frac{2x}{3} = \text{all the remaining candy} = 90$

$\frac{2x}{3} = 90 \rightarrow 2x = 270$

$x = 135$

Courtney:  $\frac{x}{3}$

then:  $\frac{x}{3} - 5$

then:  $\frac{x}{3} - 5 + \frac{2x}{3} = x - 5 = 130$

Courtney has to apologize for eating

130 candies

Courtney took 45 & put  
5 back:  $45 - 5 = 40$   
then took 90 pieces so  $40 + 90 = 130$



Courtney took:  $\frac{1}{3}$

Left over:  $\frac{2}{3}$

Court put back 5: +5

Igor ate 5: -5

0

So,  $\frac{2}{3}$  is 90 pieces  
 $90 \div 2 = 45$ ;  $\frac{1}{3}$  is 45 pieces

It is like  
Nothing happened