



UC IRVINE MATH CEO

Community Educational Outreach




Meeting 7 Student's Booklet

MATHCAKES

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Contents

- 1 Mr Panadero
- 2 Bake Sales
- 3 Hot Chocolate



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<http://www.math.uci.edu/mathceo/>

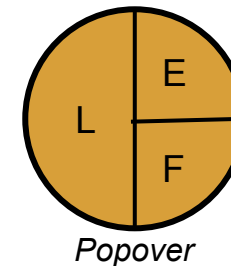


1 Mr Panadero

Mr Panadero loves baking, and he is really good at it... His secret is to always use the main ingredients in the correct ratio.

These are his directions to create the perfect batter.

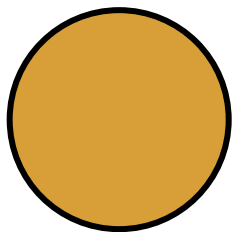
- ❑ Pound Cake = 1 part butter : 1 part sugar : 1 part egg: 1 part flour
- ❑ Angel Food Cake = 3 parts egg white : 3 parts sugar : 1 part flour
- ❑ Muffin = 2 parts flour : 2 parts liquid : 1 part egg: 1 part butter
- ❑ Fritter = 2 parts flour : 2 parts liquid : 1 part egg
- ❑ Pancake = 2 parts flour : 2 parts liquid : 1 part egg: 1/2 part butter
- ❑ Popover = 2 parts liquid : 1 part egg: 1 part flour
- ❑ Crepe = 1 part liquid : 1 part egg: 1/2 part flour.



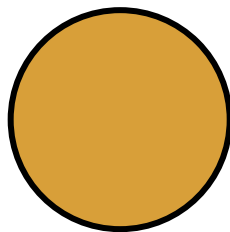
- F Flour
- E Egg
- S Sugar
- B Butter
- L Liquid
- W Egg White

Pie charts

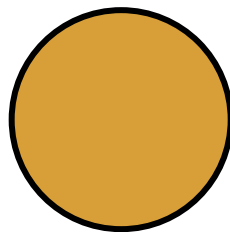
a Draw a pie chart for each batter, following the example of the popover on the right.



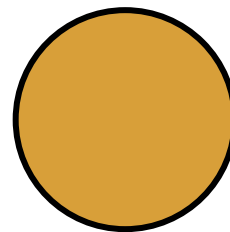
Pound Cake



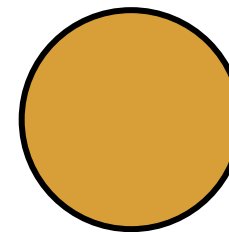
Angel Food Cake



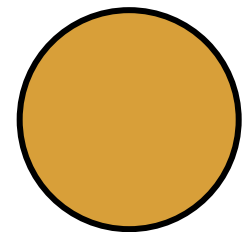
Muffin



Fritter



Pancake



Crepe

Recall Mr Panadero's directions to create the perfect batter.

- Pound Cake = 1 part butter : 1 part sugar : 1 part egg: 1 part flour
- Angel Food Cake = 3 parts egg white : 3 parts sugar : 1 part flour
- Muffin = 2 parts flour : 2 parts liquid : 1 part egg: 1 part butter
- Fritter = 2 parts flour : 2 parts liquid : 1 part egg
- Pancake = 2 parts flour : 2 parts liquid : 1 part egg: 1/2 part butter
- Popover = 2 parts liquid : 1 part egg: 1 part flour
- Crepe = 1 part liquid : 1 part egg: 1/2 part flour.

The most flour

- b** Which of these batters requires the most flour: crepe, muffin, pancake or fritter?

(Compute what fraction of the entire batter is made of flour, and compare.)

Write your process and answers in your notebook.

Pancakes, muffins and angel cake

- c** Complete these recipes.



Pancake

100 gr of flour
 _____ gr of liquid
 _____ gr of eggs
 _____ gr of butter



Muffin

100 gr of flour
 _____ gr of liquid
 _____ gr of eggs
 _____ gr of butter



Angel cake

_____ gr of flour
 _____ gr of sugar
 _____ gr of egg whites

 = 350 grams of Angel Cake





2 Bake Sales

Miss Panadera goes to the Sweet Shop to buy ingredients for her cakes... She finds the following manager specials:

- 4 bars of butter + a dozen eggs = \$7
- 1 bag of flour + a dozen eggs = \$7



Shopping at the Sweet Shop

- a** If she can buy each item individually at the manager special discount price, what would cost more, 2 bag of flour or 4 bars of butter?


Write your process and answers in your notebook.

- b** If a bar of butter is \$.75, how much does a bag of flour cost? What about a dozen of eggs?



Running a bake sale

- c** Suppose 10 bags of flour, 6 dozen eggs and 8 bars of butter allow you to make 25 cakes. If Miss Panadera wants to make a profit of \$4 on each cake she sells, what is the price she should set for each cake she sells? Suppose you buy all your ingredients at the Sweet Shop at the manager special's prices.

 Continues...

Shopping at Superbakery (the competitor store)

d Superbakery offers the following combination special:

- 1 dozens eggs + 2 bags of flour = \$8
- 3 dozens eggs + 1 bag of flour = \$11.50

Again, suppose you can buy each individual item at the special prices:

How much does a bag of flour costs?

e If you want to save money and need to buy eggs, would you go to Albertson or Target?

Write your process and answers in your notebook.





3 Hot chocolate

Labels for chili peppers

- a** You decide to make “hot” chocolate for your friends, and go to the store to buy chili peppers.

There are 3 crates in front of you.

- Crate 1 contains *only habanero* peppers.
- Crate 2 contains *only jalapeño* peppers.
- Crate 3 contains *both jalapeño and habanero* peppers.

Each crate is labeled. The three labels read “Habanero peppers”, “Jalapeño peppers”, and “Habanero and Jalapeño peppers”.

Unfortunately, the labeling machine has gone crazy and **all the crates are labeled incorrectly**.

If you can only take out (and look at) just one pepper from just one of the crates, how can you label ALL of the crates correctly?



Recipes for “hot” chocolate

- b** It’s time to start preparing the hot chocolate. There are only three ingredients: 4 cups of milk, 1 chili pepper and a teaspoon of 1 spice. However, some important choices must be made:

- You can use 2% milk or skim milk
- You can use a Habanero or a Jalapeño pepper.
- You can use nutmeg, cinnamon or Cayenne pepper.

How many different recipes for “hot” chocolate can you make with these ingredients?

Write your process and answers in your notebook