MAT 095 – LAB 5 – Introduction to fractions

Please show your work! All your answers need to be justified to receive credit!

Who will get more pizza?

1. There are 18 vegetarians and 35 non-vegetarians at a party. The host ordered 3 veggie pizzas and 7 non-veggie pizzas. Veggie pizzas will be shared equally among vegetarians and non-veggie pizzas will be shared equally among non-vegetarians.

   a) Assume each pizza is pre-sliced into eight pieces, how many pieces of pizza will each vegetarian have?

   **Solution 1** There are 3 veggie pizzas, so there are 24 slices of pizza. With 18 vegetarians, after each vegetarian receives 1 slice there will be 6 slices left. To share those 6 slices equally among 18 vegetarians, we will need to divide each slice into 3 pieces. So each vegetarian will have 1 and 1/3 slices of pizzas.

   **Solution 2** There are 3 veggie pizzas for 18 vegetarians. 6 vegetarians will share each veggie pizza. Since each pizza is pre-sliced into 8 pieces, there are 2 slices left after each of the 6 vegetarians take one piece. So we will need to divide the two remaining slices into 3 pieces each. So each vegetarian will have 1 and 1/3 slices of pizzas.

   b) Assume each pizza is pre-sliced into eight pieces, how many pieces of pizzas will each non-vegetarian have? Show your work!

   c) Will the vegetarians or the non-vegetarians have more pizza per person? Explain your reasoning?

Who will drink more soda?

2. Two groups of friends are drinking soda. The first group, of 5 people, bought 3 bottles of soda and the second group, of 7 people, bought 5 bottles of soda. Which group will have more soda for each person after they share equally?
Which team gets better paid?

3. A team of 3 people was hired to paint a house. They were paid $100 for the job. Another team, of 4 people, was hired to paint a different house. They were paid $130 for the job. Which team made more money per person?

Making Dark Chocolate Brownies

Here is a recipe for making 24 dark chocolate brownies. It comes from the following website:


Ingredients

- 8 ounces bittersweet chocolate, coarsely chopped
- 2 tablespoons unsalted butter
- 1 cup whole grain pastry flour*
- 1/4 cup unsweetened natural cocoa powder
- 1/4 teaspoon salt
- 1/4 teaspoon baking soda
- 4 large eggs
- 1 cup packed light brown sugar
- 1/2 cup plain low-fat yogurt
- 1/4 cup canola oil
- 2 teaspoons vanilla extract
- 3/4 cup chopped walnuts (optional)

Serving size: 1 square

* whole grain pastry flour (also called whole wheat pastry flour) is found in many major supermarkets and in most health food stores. If you cannot find it you may substitute 1/2 cup whole wheat flour and 1/2 cup all purpose flour in this recipe.
Per Serving without walnuts:

Calories 150; Total Fat 8 g; (Sat Fat 3 g, Mono Fat 2 g, Poly Fat .8 g); Protein 3 g; Carb 18 g; Fiber 1 g; Cholesterol 40 mg; Sodium 55 mg

Per Serving with walnuts:

Calories 170; Total Fat 10 g; (Sat Fat 3 g, Mono Fat 2.3 g, Poly Fat 2.6 g); Protein 3 g; Carb 19 g; Fiber 2 g; Cholesterol 40 mg; Sodium 55 mg

4. Now you want to make 36 squares of brownies. Please list all ingredients with the right quantities.

**Solution.** To make 36 squares of brownies, we need to make 12 more squares than the recipe calls for. That is, we need 1/2 more for each ingredient. For example, we know that 8 ounces of bittersweet chocolate is needed to make 24 squares of brownies, so to make 36 squares (which is 12 more squares than the original 24) we need half of 8 ounces (4 ounces) more chocolate. So we need 8+4=12 ounces of bittersweet chocolate. Using the same method we will have the following:

- 8+4=12 ounces bittersweet **chocolate**, coarsely chopped
- 2+1=3 tablespoons unsalted butter
- 1+1/2=3/2 cup whole grain pastry flour
- 1/4+1/8=3/8 cup unsweetened natural cocoa powder
- 1/4+1/8=3/8 teaspoon salt
- 1/4+1/8=3/8 teaspoon baking soda
- 4+2=6 large eggs
- 1+1/2=3/2 cup packed light brown sugar
- 1/2+1/4=3/4 cup plain low-fat yogurt
- 1/4+1/8=3/8 cup canola oil
- 2+1=3 teaspoons vanilla extract
- 3/4+3/8=9/8 cup chopped walnuts (optional)
5. Now, what if you want to modify this recipe to make 30 squares of brownies?

   a. How many ounces of bittersweet chocolate do you need? Please explain your reasoning.

   b. How many teaspoons of baking soda do you need? Please explain your reasoning.

   c. How many cups of plain low-fat yogurt do you need? Please explain your reasoning.

6. You followed the above recipe, but without the walnuts, and ate 3 and 1/2 squares of your brownies. How many calories did you consume from eating the brownies (1 square, without walnuts, has 150 Calories)?

7. You are on a diet. You want to make sure that you’ll not consume more than 100 calories a day from eating brownies. How many squares of brownies can you have a day if you decide to use walnuts (1 square, with walnuts, has 170 Calories)?

8. (Extra Credit) Now you want quadruple the recipe, so you’ll need 4 cups of light brown sugar. But you only have a 1/2 cup measuring cup and a 3/4 cup measuring cup. What is the least number of scoops that you can to get the necessary 4 cups? Explain your answer.