

Use Algebra to Find the Best-Priced Pizza!

Have you ever wondered whether it's a good buy to order a mass-produced pizza just because it's cheap? Here's an activity that uses second-semester algebra to determine which pizza gives you the most bang for your appetite! It helps budding scholars see how math helps with real life, and it won't be too hard to "stomach" the results!



What You Need:

- An appetite
- Two pizza parlors you'd like to compare

What You Do:

1. Announce that you're going out to pizza for dinner!
2. Talk about how a pizza price can be broken down into two parts: the cost of the ingredients, and the cost of running the parlor (workers, electricity, rent, etc.) The ingredients' cost varies with the size of the area of the pizza. It can be represented by $a*d^2$, where "d" is the diameter and "a" is the constant that represents the price of the ingredients. The other costs can be represented as the constant "c." The formula is then: $p = ad^2 + c$ Where p is price, d is a pizza's diameter, A is the per-pizza cost of the ingredients, and c is the per-pizza cost of operations. Each parlor will have its own values for "a" and "c."
3. Go to the pizza parlor and order your favorite pizza. While you're waiting, write down these things: The diameter of a large pizza The cost of your pizza in a large size The diameter of a medium pizza The cost of your pizza in a medium size
4. Make a table like this, and fill in the blanks:

Pizza size	Price	Diameter	$p = ad^2 + c$
large			
medium			

For example, at my local pizza parlor, the table would look like this for pepperoni pizza:

Pizza size	Price	Diameter	$p = ad^2 + c$
large	\$17	14	$17 = a*14^2 + c$
medium	\$15	12	$15 = a*12^2 + c$

5. Use algebra to solve for the constants a and c. For example, by simplifying the "medium pizza" equation to solve for c, I get: $15 = a*12^2 + c$ $15 = 144a + c$ $15 - 144a = c$ I can now substitute for c in the "large pizza" equation: $17 = a*14^2 + c$ $17 = a*14^2 + 15 - 144a$ $17 = 196a + 15 - 144a$ $17 = 52a + 15$ $52a = 2$ $a = 2/52$, or approximately .038 By plugging "a" back into the formula for "c", we get $15 - 144(.038) = c$ $9.528 = c$ Therefore, the final equation for my pizza parlor is: $p = .038d^2 + 9.528$

Now, do the same computations for yours.

6. Eat your pizza! Is it good? Give it a rating from one to ten, with one being “We’d never eat here again,” and ten being “The best pizza we’ve ever had.”
7. Save your equation and your rating. Sometime soon, go to another pizza parlor and find its equation and rating. Now, you’re ready to compare. This can lead to some interesting discussions.

Did the parlor with the lower rating have higher constants? That means it’s a bad buy – you’re paying higher fixed costs for a poor product.

Did the parlor with the higher rating have a higher “a” constant? That means you’re satisfied to pay more for superior ingredients.

Did the parlor with the higher rating have a higher “c” constant? That means you’re happy paying more for a nicer atmosphere or better location.

You can have all kinds of opinions about which pizza is the better buy, based on what your family values about pizza. You can try another parlor and compare it, too. Before long, you’ll be the neighborhood pizza experts.

Extensions:

- Graphing Practice: plot each parlor’s points for its medium and large pizzas (price, diameter) on an x-y axis. Connect the points to make a line. Will the two parlors ever sell the same pizza at the same price? Hint: look for a point of intersection.
- Challenge Question: Is buying a bigger pizza cost-effective?
- Brain Teaser: How can you cut a round pizza into eight equal slices with just 3 straight cuts? The answer is tricky, but it can be done. *Answer: (Cut the pizza in half, then in quarters. Now stack the quarters and make one last slice down the middle to get eight pieces.)*

© Copyright 2006-2012 Education.com All Rights Reserved.