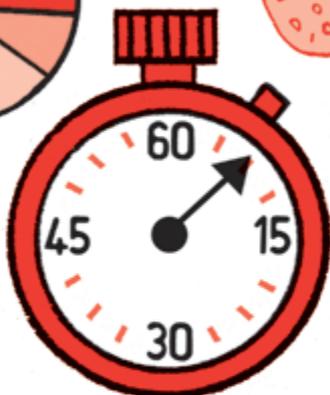


$1/10$



$1/8$

+



$\$90$



$\times 3$

= $1/16$



PEPPERONI AVENUE



PIZZA PERIL

THE CHALLENGE

It's your first day of work at *Catwalk* magazine, a dream come true. You're starting out as a lowly editorial assistant, but if you're patient and enthusiastic, then maybe one day you'll be flying off to Milan and Paris to check out the latest collections.

But that's still a daydream. For the moment you're the assistant to the glamorous

HOLD THE ANCHOVIES

We're used to choosing from dozens of toppings to go on our pizzas—whether they're thin-crust or deep-dish pizzas. Italians, though, often go for much simpler choices—maybe cheese and tomato or some sliced peppers on their pizzas.

Catwalk editor, Corey DiFerro—one of the toughest people in the business. People say that she chews up designers, photographers, receptionists—and probably editorial assistants—and spits them out. And you never did find out why the last editorial assistant at *Catwalk* lasted only one day.

You're outside the main editorial office when the door opens and someone calls to you, “Ms. DiFerro wants you—*now!*”

Inside, there's a group huddled around the main table. You recognize fashion designers, supermodels, two pop stars, photographers . . . and Corey DiFerro, looking you straight in the eye.

“Right. Do we have your attention? Look, we're off on a photo shoot in half an hour and we need some lunch first. Pizza—it's quick. Da Noi down on Seventh Avenue doesn't deliver, so I want you to go out and get some for us. Plain cheese only. Now, how hungry is everyone? I'll call your name and you tell my assistant how much you want.”

“Scala twins?”

“One slice each.”

“Art department?”

“Two pizzas.”

“Gino?”

“Half a pizza.”

“Copy editors?”

“We’ll share one pizza.”

“Arturo?”

“Three slices.”

“Steve, our faithful driver?”

“One—one pizza, that is.”

“And I’ll have one slice,” says Ms. DiFerro. She hands you a roll of bills and sends you off, saying, “They only take cash. Don’t take too long.”

On the elevator down, you count out the cash—\$90 exactly. Will that be enough? You don’t have any cash of your own in case you run short, and anyway, you don’t have time to stop for more money.

At Da Noi you’re standing on tiptoes to see over the other customers. Each pizza is cut into 12 slices—no exception. And the person ahead of you has just paid \$36 for two pizzas.

It’s your turn now. Will you have enough money—and will you have a job tomorrow?



EUCLID’S ADVICE

You need to find out two things: how much each pizza costs and how many slices make up a pizza.

- **The first part is easy enough:**
You know how much someone paid for two pizzas.
- **The second part is simple—you know that Da Noi pizzas are cut into 12 equal slices.**
- **Now you have to put together all of the slices that were ordered to figure out how many more whole pizzas you need.**
- **Then add those “made up of slices” pizza(s) to the whole pizzas that others ordered to see how many you need overall.**



WORKSHEET



work it out.

THE SOLUTION

YOU'LL HAVE EXACTLY ENOUGH MONEY, BECAUSE YOU WILL NEED TO ORDER 5 PIZZAS, MAKING THE COST \$90.

Solve it, step-by-step:

- 1.** First, figure out how many pizzas you need to order. Remember, there are 12 slices per pie, so you can think of 1 slice of a pie (1 out of 12) as the fraction $\frac{1}{12}$.

List the whole pizzas first:

Art department	2 pizzas
Copy editors	1 pizza
Steve, the driver	1 pizza
<hr/>	
Total:	4 pizzas

- 2.** Now list the slices (in fractions):

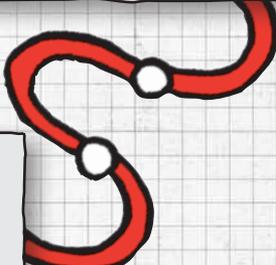
Scala twins	2 slices ($\frac{2}{12}$)
Gino	6 slices ($\frac{6}{12}$)
Arturo	3 slices ($\frac{3}{12}$)
Corey DiFerro	1 slice ($\frac{1}{12}$)



3. Add up the slices:

$$\frac{2}{12} + \frac{6}{12} + \frac{3}{12} + \frac{1}{12} = \frac{12}{12} = 1$$

Total: 1 pizza



4. That means you need to order 5 pizzas.

$$4 + 1 = 5 \text{ pizzas}$$



5. Next, figure out if you have enough money for 5 pizzas if 2 pizzas cost \$36.

$$36 \div 2 = \$18 \text{ per pizza}$$

$$18 \times 5 = \$90$$

That means 5 pizzas will cost you exactly \$90. You have just enough money—for everyone else's lunch, that is.

MATH LAB

When you're ordering something like a pizza, it can get confusing trying to work out just how much you need. How big is a "large"? How small is a "small"? How many smalls would it take to make a large? What's better value—two small or one large pizza? Well, if you know the diameter of the pizzas, you can work it out yourself using a little math. Sometimes the result is surprising.

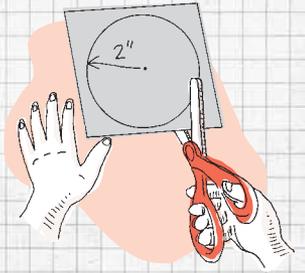
In this lab, you'll see that the area of two smaller circles (pretend they're small pizzas) is still less than the area of one large pizza—even though the width of each small pizza is more than half the width of the large pizza. You can work out the area of a circle by multiplying a special number called π (which equals about 3.14) by the square of the radius of the circle. The symbol for pi (π) stands for the special constant that represents certain relationships within every circle.

YOU WILL NEED

- 3 SHEETS OF 9 BY 12-INCH CONSTRUCTION PAPER
(2 BLUE AND 1 RED)
- COMPASS
- PENCIL
- SCISSORS

METHODS

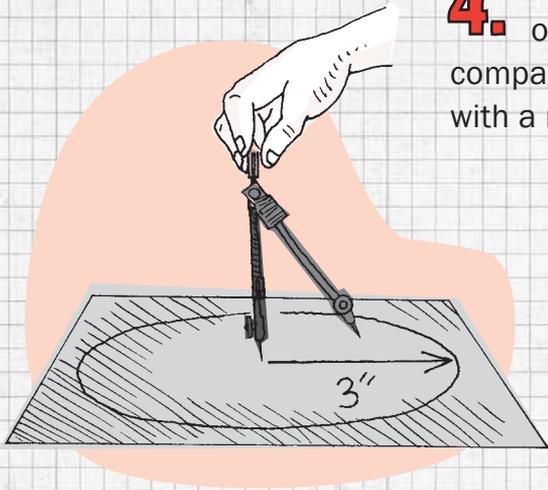
1. Set a blue piece of paper on a table or desk and use the compass to trace a circle that has a radius of 2 inches.



2. Cut out that circle and set it aside.

3. With the second piece of blue paper, repeat steps 1 and 2.

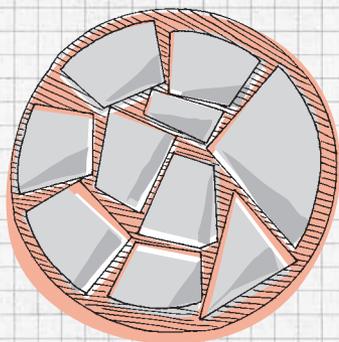
4. Take the red piece of paper and use the compass to draw a circle with a radius of 3 inches.



5. Cut that circle out.

6. Now try to put both blue circles inside the larger, red circle without having any portions of the blue circles overlapping. Do this by cutting off pieces of the blue circles and placing them wherever there's still red showing.

7. When you've fully taken apart the blue circles and placed them in the red circle without any overlapping, you should still have some red showing. This proves that the area of the larger circle is still larger than the combined areas of the smaller circles.



8. Of course, you could have saved yourself a lot of measuring and cutting by using math to show how the areas of the circles matched up. Use the following equation to determine the area of a circle:

$$\text{Area} = \pi \times \text{radius squared} \\ (\text{or, } A = \pi r^2)$$

and you'll see that the area of the large (red) circle (which had a radius of 3 inches) is

$$\pi \times 3^2 \\ 3.14 \times 9 = 28.26 \text{ square inches}$$

The area of each smaller (blue) circle is

$$\pi \times 2^2 \\ 3.14 \times 4 = 12.56 \text{ square inches}$$

Twice that figure makes 25.12 square inches, which is still smaller than the area of the larger (red) circle.

BEAT THE CALCULATOR

Here's a quick trick you can play on a friend. Make sure she has a calculator and tell her that you're going to have a race—she with the calculator against you doing mental arithmetic. All you have is a pencil and paper to write down your answer. Now find a calendar and open it to any month.

Ask your friend to draw (or imagine) a 3-by-3-inch square around any nine dates on the calendar. Let's say she has selected:

12	13	14
19	20	21
26	27	28

Make sure she has her calculator turned on and ask her to add up those nine numbers. Meanwhile you can write down “180” on the slip of paper and turn it facedown. In about a minute, she'll show you her answer (also “180”). You can then reveal your own.

Try it again with another nine dates and you'll still beat her. And again. And again. Why? Because you've simply multiplied the middle date (“20” in the example) by 9. And if you want a hint about multiplying by 9, just remember to multiply by 10 (just add a digit zero—“0”) and then subtract the number. So 20×9 is the same as 20×10 (200) minus 20 . . . or 180!