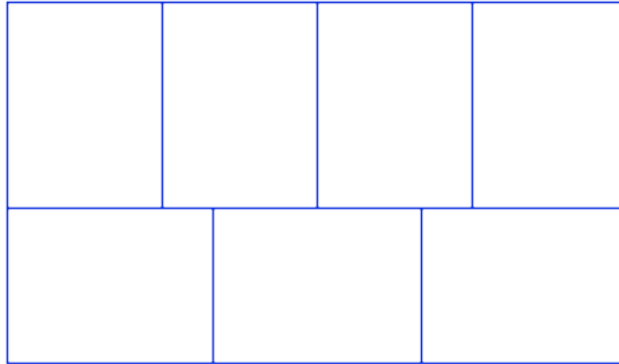


Congruent Rectangles

These seven congruent rectangles form a larger rectangle.



Question: If the area of the larger rectangle is 756 units^2 , what is its perimeter?

James

The perimeter is 166 units.

I knew that area was length times width. So I knew that 27 times 28 gave me 756. So I added 28 plus 28 plus 27 plus 27 to get my answer of 166.

Erika

The perimeter would be 114 units.

I am trying to find the solution to the perimeter of the figure shown. Since I knew the rectangle was divided into 7 congruent rectangles, I took the total of the area, 756 un^2 , and divided it by 7 and got that each smaller rectangle had an area of 108 un^2 . After I did that, I saw that the 4 smaller sides had to equal the 3 bigger sides because they were opposite sides and they had to be equal because it was a rectangle. I also saw that the smaller number and the larger number multiplied together had to equal 108 un^2 (which would be the area). Then I made the equation $4S=3B$ and that $S*B=108$ (S being the smaller side and B being the bigger side). I then used guess and check and plugged in various numbers. I started by plugging in 3 for S and 6 in for B and got $12=18$, which was wrong. Then 6 in for S and 9 in for B and got $24=27$, which was also wrong. Then I plugged in 9 for S and 12 for B and got $36=36$, which was correct. So I found that 9 was equal to S and 12 was equal to B. Then, looking back at the rectangle, there are 5 larger sides(B) on the perimeter and 6 smaller sides(S) on the perimeter. So $(5*12)+(6*9)$ would equal the perimeter, which is 114 units.

Dre

The perimeter of the rectangle is 111.2 units².

First I tried to solve it algebraically. I used $xy=756$ but there were too many answers so I tried finding the area of one of the smaller squares. I did this by dividing the area of the big square by seven because there are seven little triangles in the big one. $756/7 = 108$ but that got me no where.

Then I saw the answer. It takes 3 of the rectangles layed across the long way to go from one side to the other the long way but it takes 4 rectangles stacked up the tall way to get from one side to the other the long way.

Hmmm I thought I now have 2 equations and 2 unknowns. They are $3/4x = y$ and $xy = 756$.

All I need to do now is solve. I plugged in $3/4x$ into y in the second equation. I now have $x(3/4x) = 756$. I then multiplied $x \cdot 3/4x$ and got $3/4x^2 = 756$. Then I divided 756 by $3/4$ and got $x^2 = 1008$. Next I took the square root of 1008 and got $x = \text{approx. } 31.8$. To solve for y you must multiply by $3/4$ because $3/4x = y$. Therefore $y = \text{approx } 23.8$.

There are 2 x 's and 2 y 's for both sides of the rectangle. When you add those up you get $31.8 \cdot 2 + 23.8 \cdot 2 = 111.2$. The perimeter of the rectangle is 111.2 units².

Julie

The perimeter of the large triangle is 114 units.

The large rectangle is made of seven smaller, congruent rectangles. Since the area of the large rectangle is 756 units squared, the area of each small rectangle is $756/7$ (108 units squared).

If we assign (x) to be the length of the shorter side of each small rectangle and (y) to be the length of each longer side, we see that $4x=3y$, meaning the ratio of short side to long side is 3:4.

Using the ratio 3:4 we can make a table to find the possible lengths of each side and the corresponding area:

3:4

2	6:8=48 units squared
3	9:12=108 units squared
4	12:16=192 units squared

Since the area of each small rectangle is 108 units squared, the sides must be 9 and 12 units, meaning $x=9$ and $y=12$. The perimeter is $P=6x+5y$, since there are 6 short sides and 5 long sides around the the large rectangle's perimeter. Plugging x and y in, the perimeter is $6(9)+5(12)$, which equals 114 units.