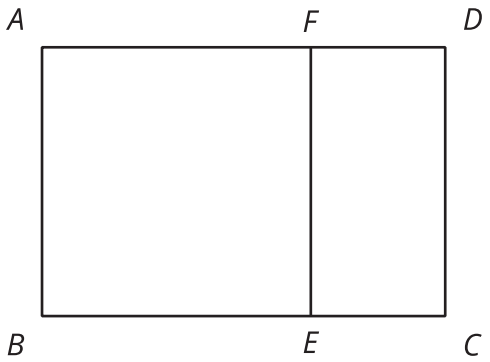
Unit 9, Lesson 10

Rectangle Madness

Let's cut up rectangles.

10.1 Squares in Rectangles

1. Rectangle $ABCD$ is not a square. Rectangle $ABEF$ is a square. Use the possible segment lengths to find the missing segment length.



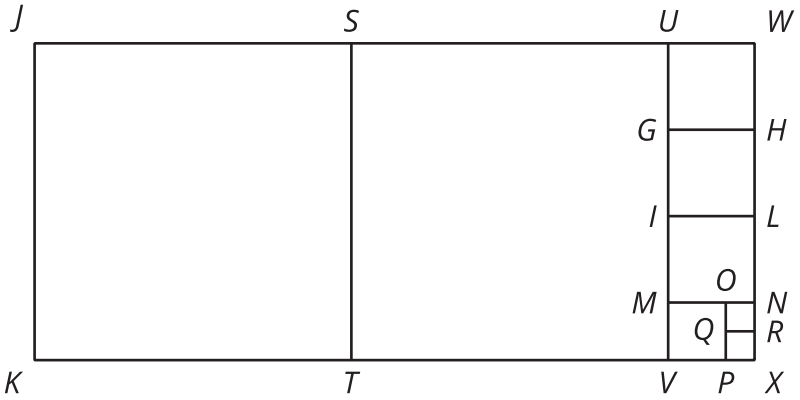
   a. If segment AF is 5 units long and segment FD is 2 units long, how long would segment AD be?

   b. If segment BC is 10 units long and segment BE is 6 units long, how long would segment EC be?

   c. If segment AF is 12 units long and segment FD is 5 units long, how long would segment FE be?

   d. If segment AD is 9 units long and segment AB is 5 units long, how long would segment FD be?

2. Rectangle $JKXW$ has been decomposed into squares.



Segment JK is 33 units long and segment JW is 75 units long. Find the areas of all of the squares in the diagram.

3. Rectangle $ABCD$ is 16 units by 5 units.

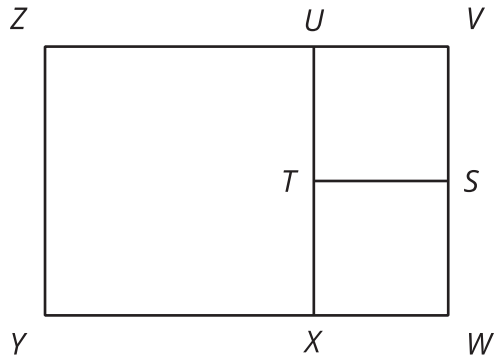
a. In the diagram, draw a line segment that decomposes $ABCD$ into two regions: a square that is the largest possible and a new rectangle.

b. Draw another line segment that decomposes the *new* rectangle into two regions: a square that is the largest possible and another new rectangle.

c. Keep going until rectangle $ABCD$ is entirely decomposed into squares.

d. List the side lengths of all the squares in your diagram.

Are you ready for more?



1. The diagram shows rectangle $VWYZ$ which has been decomposed into 3 squares. What could the side lengths of this rectangle be?

2. How many different side lengths can you find for rectangle $VWYZ$?

3. What are some rules for possible side lengths of rectangle $VWYZ$?

10.2 More Rectangles, More Squares

1. Draw a rectangle that is 21 units by 6 units.

   a. In your rectangle, draw a line segment that decomposes the rectangle into a new rectangle and a square that is as large as possible. Continue until the diagram shows that your original rectangle has been entirely decomposed into squares.

   b. How many squares of each size are in your diagram?

   c. What is the side length of the smallest square?

2. Draw a rectangle that is 28 units by 12 units.

   a. In your rectangle, draw a line segment that decomposes the rectangle into a new rectangle and a square that is as large as possible. Continue until the diagram shows that your original rectangle has been decomposed into squares.

   b. How many squares of each size are in your diagram?

   c. What is the side length of the smallest square?

3. Write each of these fractions as a mixed number with the smallest possible numerator and denominator:

   a. $\frac{16}{5}$

   b. $\frac{21}{6}$

   c. $\frac{28}{12}$

4. What do the fraction problems have to do with the earlier rectangle decomposition problems?