Lesson 10: Dividing the King’s Foot into 12 Equal Pieces

Classwork

Opening Exercise

Use a compass to mark off equally spaced points , , , and so that , , , , and are equal in length. Describe the steps you took.



Exploratory Challenge 1

Divide segment into three segments of equal lengths.



Exercise 1

Divide segment into five segments of equal lengths.



Exploratory Challenge 2

Divide segment into four segments of equal length.



Exercise 2

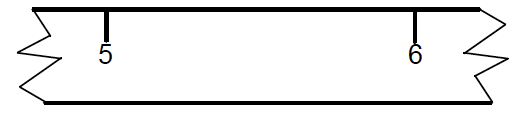
On a piece of poster paper, draw a segment with a measurement of foot. Use the dilation method to divide into twelve equal-length segments, or into inches.

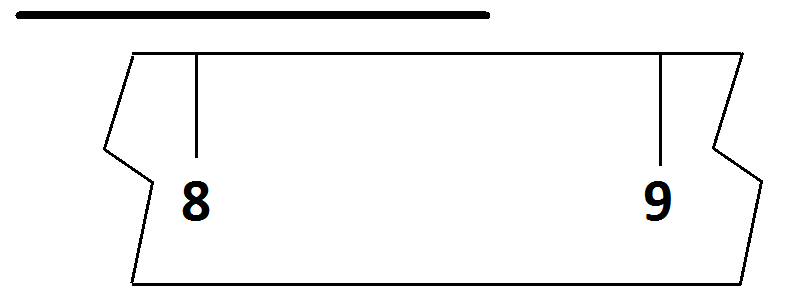
Lesson Summary

**Side splitter method**: If is a line segment, construct a ray and mark off equally spaced points using a compass of fixed radius to get points , , , ,. Construct that is a side of . Through each point ,,,, construct line segments parallel to that connect two sides of .

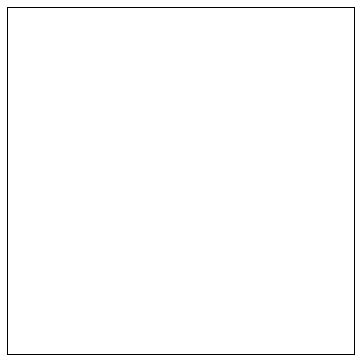
**Dilation method**: Construct a ray parallel to . On the parallel ray, use a compass to mark off equally spaced points , ,, so that . Lines and intersect at a point . Construct the rays that meet in points .

Problem Set

1. Pretend you are the king or queen and that the length of your foot is the official measurement for one foot. Draw a line segment on a piece of paper that is the length of your foot. (You may have to remove your shoe.) Use the method above to find the length of inch in your kingdom.
2. Using a ruler, draw a segment that is . This length is referred to as a decimeter. Use the side splitter method to divide your segment into ten equal-sized pieces. What should be the length of each of those pieces based on your construction? Check the length of the pieces using a ruler. Are the lengths of the pieces accurate?
3. Repeat Problem 2 using the dilation method. What should be the length of each of those pieces based on your construction? Check the length of the pieces using a ruler. Are the lengths of the pieces accurate?
4. A portion of a ruler that measured whole centimeters is shown below. Determine the location of on the portion of the ruler shown.
5. Merrick has a ruler that measures in inches only. He is measuring the length of a line segment that is between and . Divide the one-inch section of Merrick’s ruler below into eighths to help him measure the length of the segment.



1. Use the dilation method to create an equally spaced grid in the following square.



1. Use the side splitter method to create an equally spaced grid in the following square.

