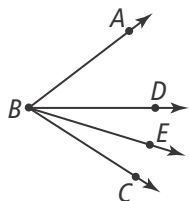


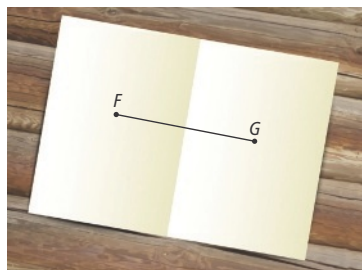


UNDERSTAND

10. **Use Appropriate Tools** How could you use a compass to determine if two segments are the same length?
11. **Higher Order Thinking** You can divide a segment into n congruent segments by bisecting segments repeatedly. What are some of the possible values of n ? Give a rule for n .
12. **Make Sense and Persevere** In the figure shown, suppose $m\angle ABC = n$ and $m\angle ABD = 2(m\angle DBC)$. The angle bisector of $\angle DBC$ is $\overrightarrow{BE}$. What is $m\angle EBC$?



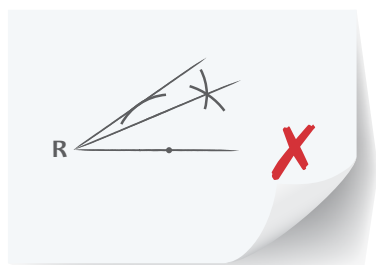
13. **Make Sense and Persevere** There are other methods for making constructions, such as paper folding. Follow the steps to use paper folding to construct the perpendicular bisector of a segment.



- On a sheet of paper, draw $\overline{FG}$.
- Fold the paper so that F is on top of G .
- Crease the paper along the fold.
- Unfold the paper. The crease line represents the perpendicular bisector.

Why must F and G be aligned when you fold the paper?

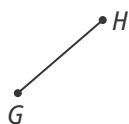
14. **Error Analysis** Adam is asked to construct the bisector of $\angle R$. Explain the error in Adam's work.



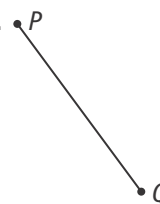
PRACTICE

Copy the segments. SEE EXAMPLE 1

15.



16.



Copy the angles. SEE EXAMPLE 2

17.



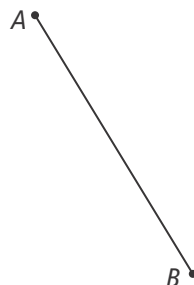
18.



Copy and bisect the segments.

SEE EXAMPLE 3

19.

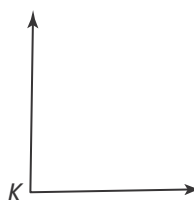


20.

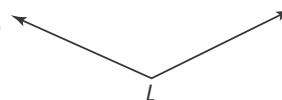


Copy and bisect the angles. SEE EXAMPLE 4

21.

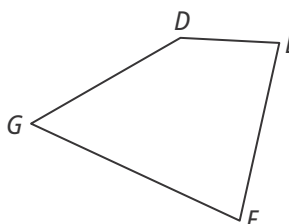


22.



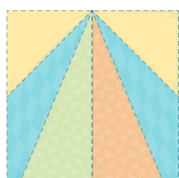
23. Where is the intersection of the perpendicular bisector of $\overline{GF}$ and the angle bisector of $\angle E$?

SEE EXAMPLE 5

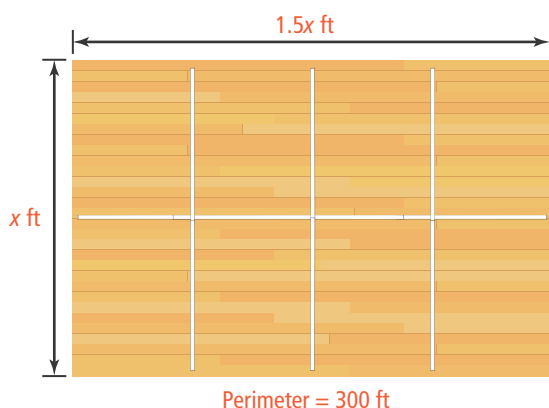


APPLY

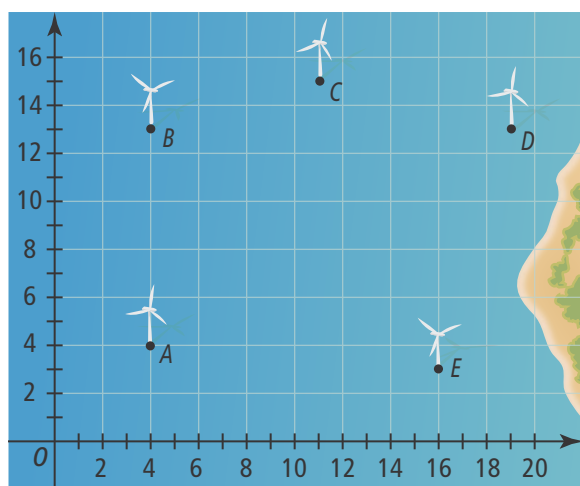
24. **Communicate Precisely** The quilt block is designed from a square using only perpendicular bisectors and angle bisectors. Write instructions for constructing the pattern in square $ABCD$. You may find it helpful to name some additional points.



25. **Mathematical Connections** A school gym is divided for a fair by bisecting its width and its length. Each half of the length is then bisected, forming 8 sections in all. What are the dimensions and area of each section?

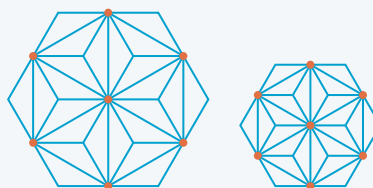


26. **Model With Mathematics** A sixth wind turbine will be placed near the intersections of the bisector of $\angle BCD$ and the perpendicular bisectors of $\overline{AE}$ and $\overline{ED}$. What is a possible location for the sixth turbine?



ASSESSMENT PRACTICE

27. The angle bisector of $\angle NPM$ is $\overrightarrow{PQ}$. Write an equation to describe the relationship between $m\angle NPM$ and $m\angle QPM$.
28. **SAT/ACT** A perpendicular bisector of $\overline{DC}$ is $\overleftrightarrow{AB}$, and a perpendicular bisector of $\overline{AB}$ is $\overline{DC}$. The intersection of $\overline{AB}$ and $\overline{DC}$ is at E . Which equation is true?
- Ⓐ $AB = CD$
Ⓑ $CE = CD$
Ⓒ $DE = CE$
Ⓓ $AE = DE$
Ⓔ $EB = CD$
29. **Performance Task** Reducing or enlarging images can be useful when you need a smaller or larger version of a picture or graph for a report or poster.



Part A Use a compass and straightedge to draw a polygon with at least 3 sides.

Part B Make a reduced version of your figure with sides that are half the length of the original figure. First, select one of the sides, bisect it, and then copy one of the halves. Next, copy one of the angles that is adjacent. Repeat until you have a reduced version of your figure.

Part C Think about how you can double the length of the line segment. Make an enlarged version of your figure with sides that are twice the length of the original figure. Describe how you made the enlarged figure.