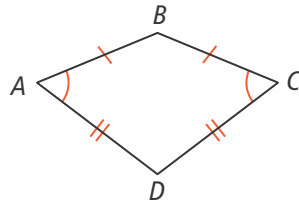
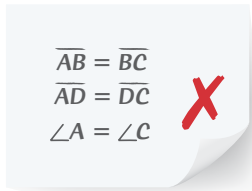


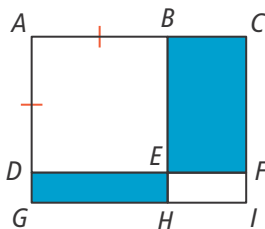


UNDERSTAND

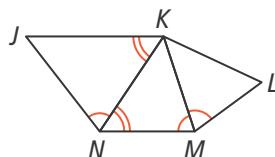
9. **Reason** The coordinate of point M on a number line is 11. If $MN = 12$, what are the possible coordinates for N on the number line?
10. **Construct Arguments** How can you use the Segment Addition Postulate to show that $AE = AB + BC + CD + DE$?
11. **Higher Order Thinking** If points C , D , and E are on a line and $CD = 20$ and $CE = 32$, what are the possible values of DE ?
12. **Error Analysis** Benito wrote the equations shown about the figure. Explain Benito's errors.



13. **Make Sense and Persevere** Point Y is in the interior of $\angle XWZ$. Given that $\overrightarrow{WX}$ and $\overrightarrow{WZ}$ are opposite rays, and $m\angle XWY = 4(m\angle YWZ)$, what is $m\angle YWZ$?
14. **Mathematical Connections** The area of $ABED$ is 49 square units. Given $AG = 9$ units and $AC = 10$ units, what fraction of the area of $ACIG$ is represented by the shaded region? Give your answer in simplest form.

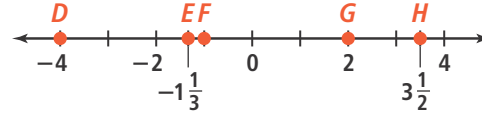


15. **Look for Relationships** In the diagram at the right, $m\angle LMN = 116$, $m\angle JKM = 122$, and $m\angle JNM = 103$. What is $m\angle NKM$?



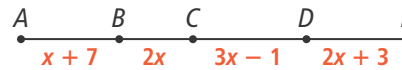
PRACTICE

Find the length of each segment. SEE EXAMPLES 1 AND 2



16. $\overline{DF}$ 17. $\overline{DE}$ 18. $\overline{FG}$
19. $\overline{FH}$ 20. $\overline{GH}$ 21. $\overline{EH}$

Points A , B , C , D , and E are collinear and $AC = 16$.
SEE EXAMPLE 3

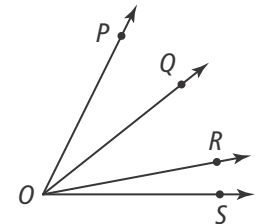


22. What is x ? 23. What is AB ?
24. What is BD ? 25. What is CE ?

Use the figure shown for Exercises 26–28.

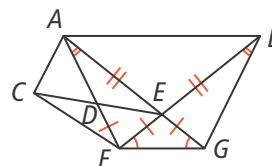
SEE EXAMPLES 4 AND 5

26. If $m\angle POQ = 24$ and $m\angle POR = 59$, what is $m\angle QOR$?
27. If $m\angle POQ = 19$, $m\angle QOR = 31$, and $m\angle ROS = 15$, what is $m\angle POS$?
28. If $m\angle QOS = 46$, $m\angle POR = 61$, and $m\angle POQ = 28$, what is $m\angle ROS$?



Suppose $EG = 3$, $EB = 8$, $AF = 7$, $m\angle EBG = 19$, $m\angle EGF = 28$, and $m\angle CAE = 51$. Find each value.

SEE EXAMPLE 6



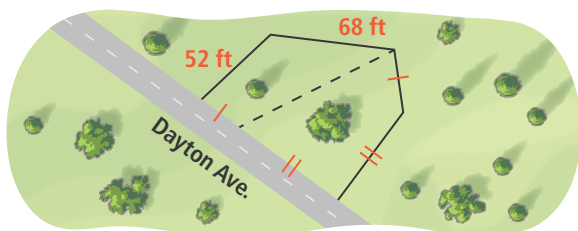
29. $\overline{EF}$ 30. AG 31. AD
32. $m\angle EFG$ 33. $m\angle CAF$ 34. DF
35. Points P , Q , R , and S are collinear. Point Q is between P and R , R is between Q and S , and $\overline{PQ} \cong \overline{RS}$. If $PS = 18$ and $PR = 15$, what is the value of QR ?

APPLY

36. **Make Sense and Persevere** Dave is driving to Gilmore to visit his friend. If he wants to stop for lunch when he is about halfway there, in which town should he plan to stop? Explain.



37. **Reason** A city planning commission must determine whether to approve the construction of a new building. The company wants to build in an area of the city that has a height limitation of 310 feet. The plans show that the first floor of the building is 20 ft high and each of the next 15 floors have a height of 11 ft, including the space between each floor needed for electrical, plumbing, and other systems. If the plan meets all other city code requirements, should the city commission approve the building plan? Explain.
38. **Reason** The city planning committee wants one tree planted every 20 ft along Dayton Avenue. If the perimeter of the plot of land is 234 ft, about how many trees will be planted? Explain.

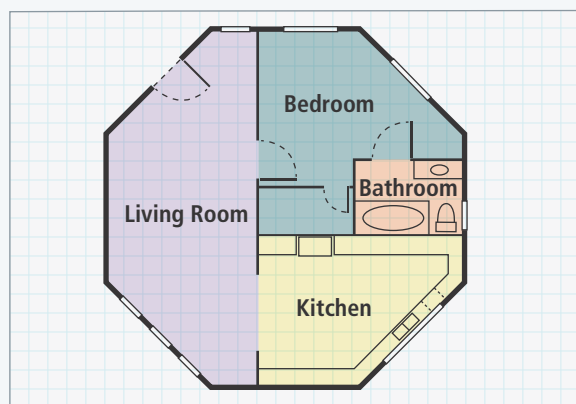


ASSESSMENT PRACTICE

39. In the diagram, $FH = 2FG$, $GH = HI$, and $FI = IK$. Which of the following statements must be true? Select all that apply.



- Ⓐ $FG = HI$ Ⓑ $HI = IJ$
 Ⓒ $IK = 3FG$ Ⓓ $FH = GI$
 Ⓔ $HJ = JK$ Ⓕ $HK = 2GI$
40. **SAT/ACT** Point C is in the interior of $\angle ABD$, and $\angle ABC \cong \angle CBD$. If $m\angle ABC = \left(\frac{5}{2}x + 18\right)$ and $m\angle CBD = (4x)$, what is $m\angle ABD$?
- Ⓐ 12 Ⓑ 36 Ⓒ 48 Ⓓ 72 Ⓔ 96
41. **Performance Task** The American Institute of Architects is located in a historical building called "The Octagon" in Washington, DC. Octagonal houses became popular in the United States in the mid-1800s.



Part A Design your own plan for one floor of an octagonal-shaped house. Your plan should include at least four rooms, two walls of equal length, and two angles with equal measure. Draw your floor plan using the scale 1 cm = 1 m. Write the measures of the angles and lengths of the walls on your plan, and use appropriate marks to show congruent angles and segments. Label all the points in your diagram where the walls intersect.

Part B Write equations that show congruent angles and segments in your plan.