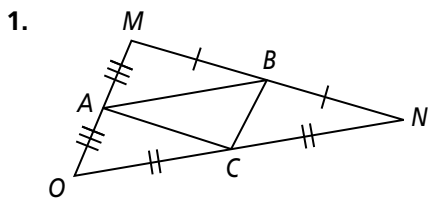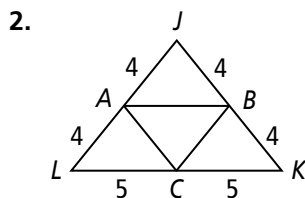# Practice

Midsegments of Triangles

Identify three pairs of triangle sides in each diagram.

1.

$\overline{AB} \parallel \overline{ON}; \ \overline{AC} \parallel \overline{MN}; \ \overline{BC} \parallel \overline{MO}$

2.

$\overline{AB} \parallel \overline{LK}; \ \overline{AC} \parallel \overline{JK}; \ \overline{BC} \parallel \overline{JL}$

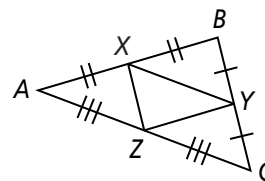**Name the triangle sides that are parallel to the given side.**

3. $\overline{AB}$ **ZY**

4. $\overline{AC}$ **XY**

5. $\overline{CB}$ **ZX**

6. $\overline{XY}$ **AC**

7. $\overline{XZ}$ **BC**

8. $\overline{ZY}$ **AB**

Points M, N, and P are the midpoints of the sides of △QRS.
QR = 30, RS = 30, and SQ = 18.

9. Find *MN*. **9**

10. Find *MQ*. **15**

11. Find *MP*. **15**

12. Find *PS*. **9**

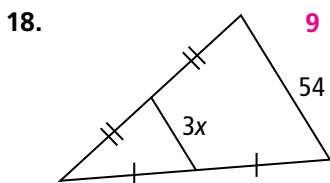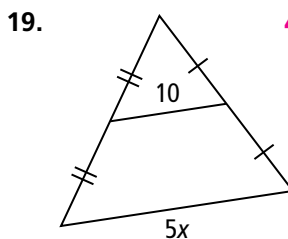**13.** Find *PN*. **15**
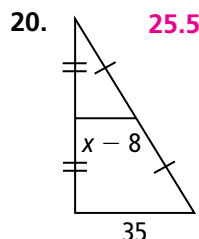
14. Find *RN*. **15**
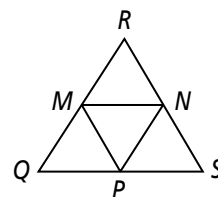
Algebra Find the value of *x*.

15. **17**

16. **20.5**

17. **7**

18. **9**

19. **4**

20. **25.5**

21. **3**
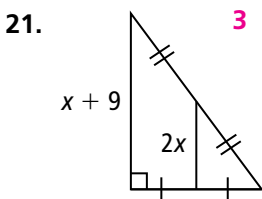

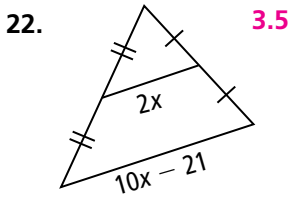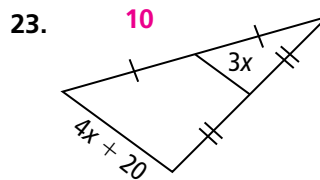**22.** **3.5**
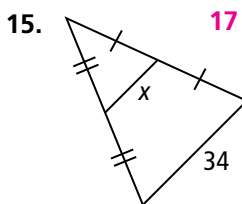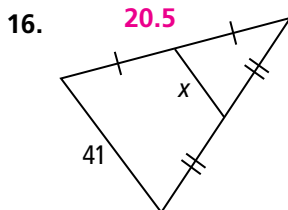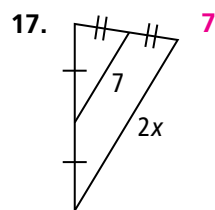
23. **10**

Practice (continued)   *Form G*
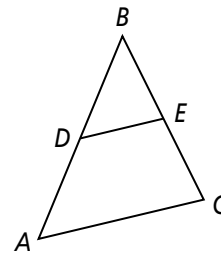
Midsegments of Triangles

D is the midpoint of $\overline{AB}$. E is the midpoint of $\overline{CB}$.
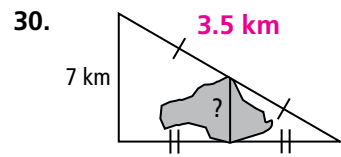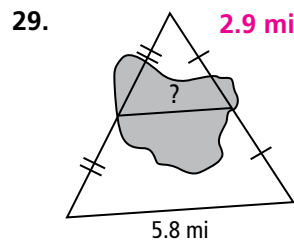
24. If $m\angle A = 70$, find $m\angle BDE$. **70**
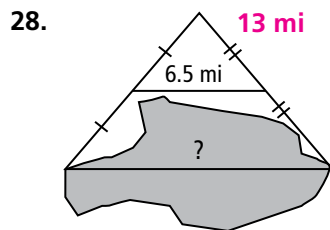
25. If $m\angle BED = 73$, find $m\angle C$. **73**

26. If $DE = 23$, find AC. **46**

27. If $AC = 83$, find DE. **41.5**

Find the distance across the lake in each diagram.

28. **13 mi**
6.5 mi
?

29. **2.9 mi**
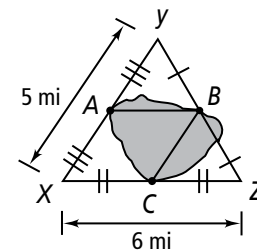?
5.8 mi

30. **3.5 km**
7 km
?

Use the diagram at the right for Exercises 31 and 32.

31. Which segment is shorter for kayaking across the lake, $\overline{AB}$ or $\overline{BC}$? Explain.
$\overline{BC}$ is shorter because BC is half of 5 mi, while AB is half of 6 mi.

32. Which distance is shorter, kayaking from A to B to C, or walking from A to X to C? Explain.
Neither; the distance is the same because $\overline{BC} \cong \overline{AX}$ and $\overline{AB} \cong \overline{XC}$.

33. Open-Ended Draw a triangle and all of its midsegments. Make a conjecture about what appears to be true about the four triangles that result. What postulates could be used to prove the conjecture? **Check students' drawings. Conjecture: The four triangles formed by the midsegments of a triangle are congruent. The SAS or SSS postulates can be used in each case to show that each triangle is congruent to the others.**

34. Coordinate Geometry The coordinates of the vertices of a triangle are $K(2, 3)$, $L(-2, -1)$, and $M(5, 1)$.

  a. Find the coordinates of N, the midpoint of $\overline{KM}$, and P, the midpoint of $\overline{LM}$.
  $N(3.5, 2); P(1.5, 0)$

  b. Show that $\overline{NP} \parallel \overline{KL}$. **The slope of $\overline{NP} = \dfrac{2-0}{3.5-1.5} = 1$ and the slope of $\overline{KL} = \dfrac{3-(-1)}{2-(-2)} = 1$. Because the slopes are equal, $\overline{NP} \parallel \overline{KL}$.**

  c. Show that $NP = \frac{1}{2}KL$. **$NP = \sqrt{(3.5-1.5)^2 + (2-0)^2} = 2\sqrt{2}$ and $KL = \sqrt{(-2-2)^2 + (-1-3)^2} = 4\sqrt{2}$ so $NP = \frac{1}{2}KL$.**