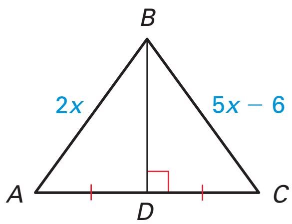
LESSON 5.2

Exercise Set A

MM1G3e Find and use points of concurrency in triangles: incenter, orthocenter, circumcenter, and centroid.

Find the length of $\overline{AB}$.

1.



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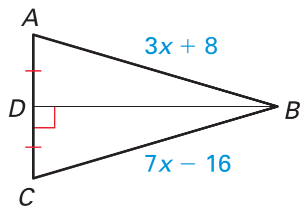

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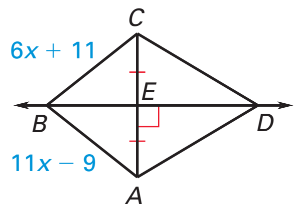
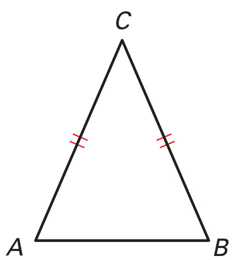


Tell whether the information in the diagram allows you to conclude that *C* is on the perpendicular bisector of $\overline{AB}$.

4.



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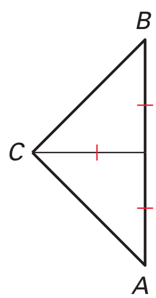

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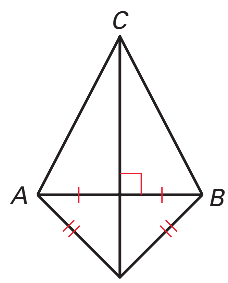


Use the diagram. $\overline{EH}$ is the perpendicular bisector of $\overline{DF}$. Find the indicated measure.

7. Find EF.

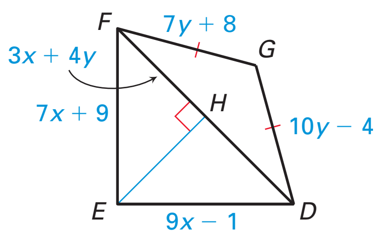
8. Find DE.

9. Find FG.

10. Find DG.

11. Find FH.

12. Find DF.



In the diagram, the perpendicular bisectors of $\triangle ABC$ meet at point *G* and are shown dashed. Find the indicated measure.

13. Find AG.

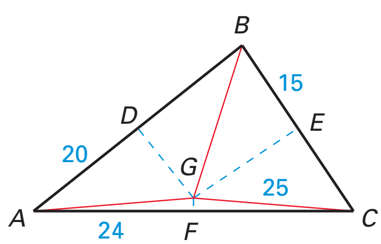
14. Find BD.

15. Find CF.

16. Find BG.

17. Find CE.

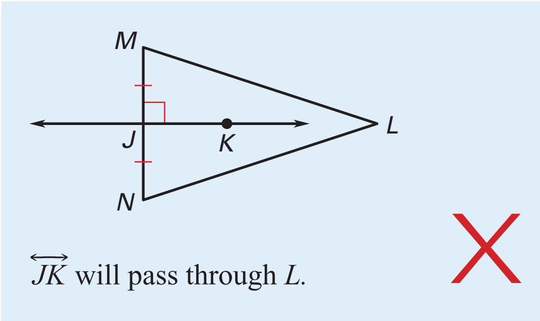
18. Find AC.



UNIT 5

Exercise Set A *(continued)*

19. **Error Analysis** *Explain* why the conclusion is not correct given the information in the diagram.



Draw $\overline{AB}$ with the given length. Construct the perpendicular bisector and choose point C on the perpendicular bisector so that the distance between C and $\overline{AB}$ is 1 inch. Measure $\overline{AC}$ and $\overline{BC}$.

20. $AB = 0.5$ inch

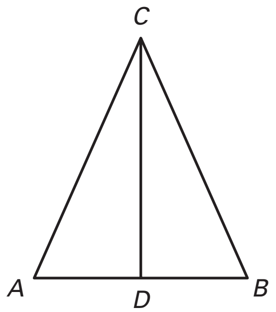
21. $AB = 1$ inch

22. $AB = 2$ inches

Write a two-column or a paragraph proof.

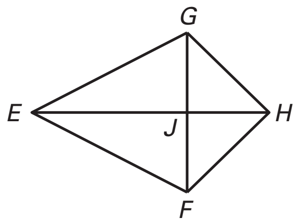
23. **GIVEN:** C is on the perpendicular bisector of $\overline{AB}$.

PROVE: $\triangle ACD \cong \triangle BCD$

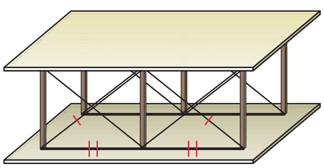


24. **GIVEN:** $\triangle GHJ \cong \triangle FHJ$

PROVE: $\overline{EF} \cong \overline{EG}$



25. **Early Aircraft Set** On many of the earliest airplanes, wires connected vertical posts to the edges of the wings, which were wooden frames covered with cloth. The lengths of the wires from the top of a post to the edges of the frame are the same and distances from the bottom of the post to the ends of the two wires are the same. What does that tell you about the post and the section of frame between the ends of the wires?



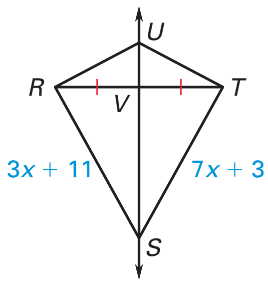
LESSON 5.2

Exercise Set B

MM1G3e Find and use points of concurrency in triangles: incenter, orthocenter, circumcenter, and centroid.

Find the length of $\overline{RS}$.

1.



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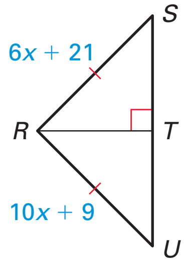
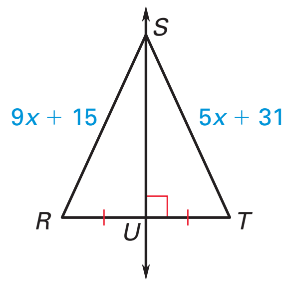


3.



Use the diagram. $\overline{DE}$ is the perpendicular bisector of $\overline{AC}$. Find the indicated measure.

4. Find AB.

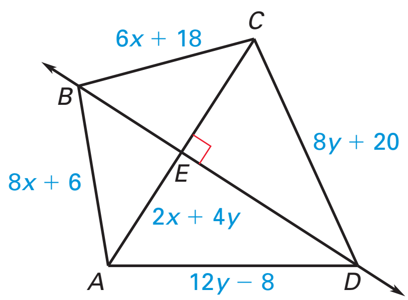
5. Find AE.

6. Find AD.

7. Find BC.

8. Find AC.

9. Find CD.



UNIT 5

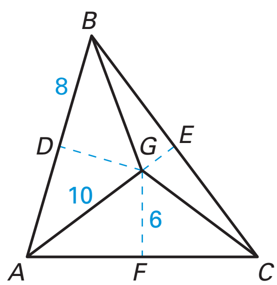
Draw $\overline{AB}$ with the given length. Construct the perpendicular bisector and choose point D on the perpendicular bisector so that the distance between D and $\overline{AB}$ is 2 inches. Measure $\overline{AD}$ and $\overline{BD}$.

10. $AB = 2$ inches

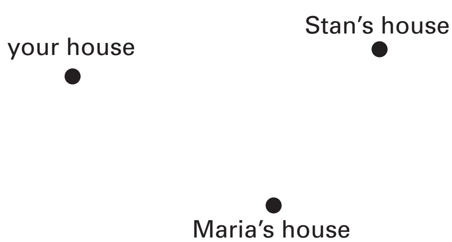
11. $AB = 1.5$ inches

12. $AB = 1$ inch

13. The perpendicular bisectors of $\triangle ABC$ meet at point G and are shown as dashed lines. Find BG.



14. **Exercising** You and two friends plan to exercise together. You want your meeting place to be the same distance from each person's house. *Explain* how you can use the diagram to locate the meeting place.



Exercise Set B *(continued)*

In Exercises 15 and 16, copy and complete the statement using *always*, *sometimes*, or *never*.

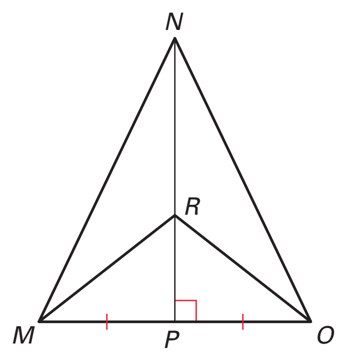
15. A perpendicular bisector of a triangle __?__ passes through the midpoint of a side of the triangle.

16. Angle bisectors of a triangle __?__ intersect at a single point.

In Exercises 17 and 18, write a two-column or a paragraph proof.

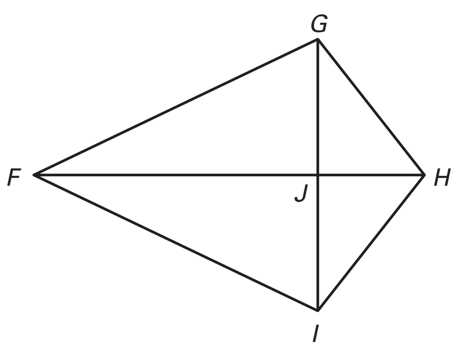
17. **GIVEN:** $\overline{NP}$ is a perpendicular bisector of $\overline{MO}$.

PROVE: $\triangle NMR \cong \triangle NOR$

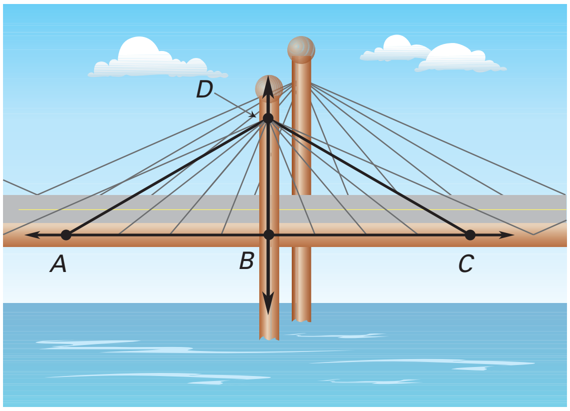


18. **GIVEN:** $\triangle FJG \cong \triangle FJI$

PROVE: $\overline{HI} \cong \overline{HG}$



19. **Bridge** In the diagram, the road is perpendicular to the support beam and $\overline{AB} \cong \overline{CB}$. What theorem allows you to conclude that $\overline{AD} \cong \overline{CD}$? *Explain*.



UNIT 5