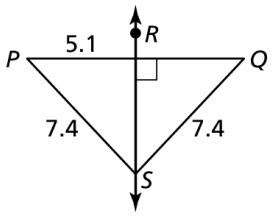
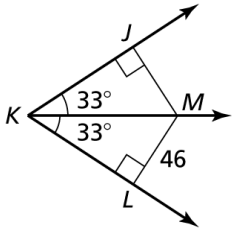
Geometry Chapter 6.1-6.4 Review

Find the measure.

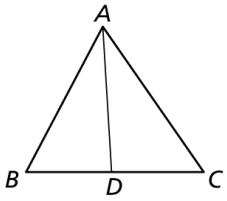
1. PQ



2. JM



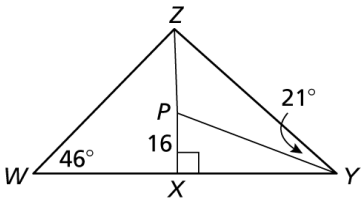
Use the diagram to find the indicated angle measure.



3. Given $m\angle B = 57°$, $m\angle C = 51°$, and $\overline{AD}$ bisects $\angle BAC$, find $m\angle ADC$.

4. Given $m\angle B = 66°$, $m\angle BAD = 34°$, and $\overline{AD}$ bisects $\angle BAC$, find $m\angle DAC$.

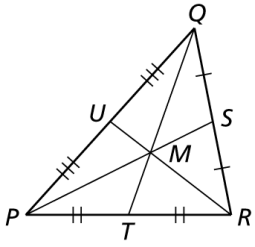
5. $\overline{PZ}$ and $\overline{PY}$ are angle bisectors of ΔWYZ. Find the measure of $\angle WZP$.



6. Find the circumcenter of ΔABC with vertices $A(12, 0)$, $B(0, -6)$, and $C(0, 0)$.

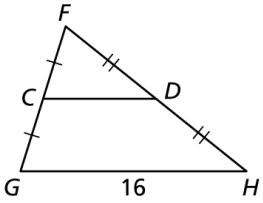
7. Your friend is trying to balance a triangle on the tip of his pencil. Find the coordinates on the centroid if the triangle has vertices of $(2, 4)$, $(10, 6)$, and $(12, -10)$.

8. In $\Delta PQR, SP = 78,$ and $UM = 19$. Find *SM*, *MR*, and *UR*.

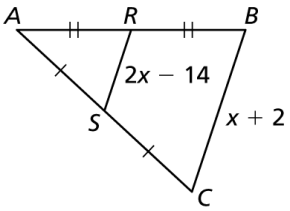


Find the missing length indicated.

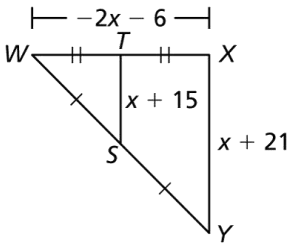
9. *CD*



10. *SR*



11. *TS*



In Exercises 12 and 13, tell whether the orthocenter is *inside*, *on*, or *outside* the triangle. Then find the coordinates of the orthocenter.

12. $Q(-1, 5)$, $R(4, 3)$, $S(-1, -2)$

13. $L(4, 6)$, $M(-3, 2)$, $N(-2, -6)$

14. Find the coordinates of the circumcenter of the triangle with the vertices $A(4, 12)$, $B(14, 6)$, and $C(-6, 2)$.

15. Find the coordinates of the endpoints of all three midsegments for the given triangle.
$A(-2, -4)$, $B(4, 8)$, $C(6, -2)$

16. A cellular phone company is building a tower at an equal distance from three large apartment buildings. Explain how you can use the figure at the right to determine the location of the cell tower.

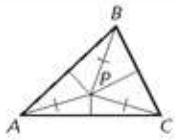
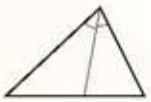
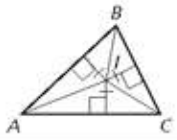
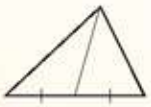
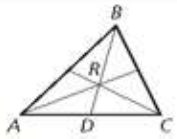
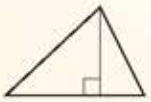
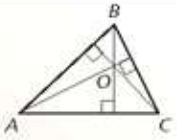
17. Your friend says that it is impossible for the circumcenter of a triangle to lie outside the triangle. Is your friend correct? Explain your reasoning.

18. Can the circumcenter and the incenter of an obtuse triangle be the same point?

19 and 20. Using constructions, find the incenter and circumcenter. Use the points of concurrency to inscribe and circumscribe a circle.

Concept Summary

Segments, Lines, Rays, and Points in Triangles

	Example	Point of Concurrency	Property	Example
perpendicular bisector		circumcenter	The circumcenter P of a triangle is equidistant from the vertices of the triangle.	
angle bisector		incenter	The incenter I of a triangle is equidistant from the sides of the triangle.	
median		centroid	The centroid R of a triangle is two thirds of the distance from each vertex to the midpoint of the opposite side.	
altitude		orthocenter	The lines containing the altitudes of a triangle are concurrent at the orthocenter O.	

Answers:

1. 10.2 **2.** 46 **3.** $93°$ **4.** $34°$ **5.** 46°

6. $(6, -3)$ **7.** Centroid is $(8, 0)$ **8.** $SM = 26$, $MR = 38$, and $UR = 57$ **9.** 8

10. 6 **11.** 6 **12.** inside (1, 3) **13.** Outside $\left(-8, \frac{9}{2}\right)$ **14.** $\left(\frac{9}{2}, \frac{3}{2}\right)$

15. $(1, 2)\&(5, 3), (5, 3)\&(2, -3), (1, 2)\&(2, -3)$

16. Construct the circumcenter of the triangle formed by the locations of the three buildings. The tower is located at the circumcenter.

17. No; The circumcenter of an obtuse triangle is outside the triangle, and the circumcenter of a right triangle lies on the hypotenuse.

18. No; The circumcenter of an obtuse triangle is outside the triangle and the incenter of any triangle is inside the triangle.