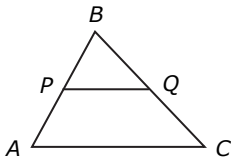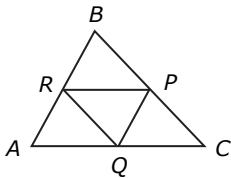# LESSON 163 Review: Properties of Triangles

1. In $\triangle ABC$, PQ is a midsegment. What is PQ if $AC = 16$?

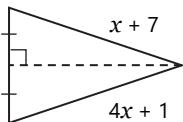

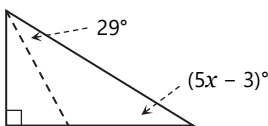2. In $\triangle ABC$ above, what is $m\angle A$ if $m\angle APQ = 118°$?

3. In $\triangle ABC$, P, Q, and R are the midpoints of the sides. Find the perimeter of $\triangle PQR$ if $AB = 14$, $BC = 16$, and $AC = 18$.
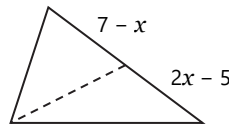

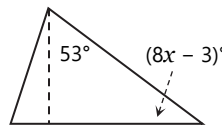4. The dashed segment is a perpendicular bisector of a side of the triangle. What is the value of x?

5. The dashed segment is an angle bisector of an angle of the triangle. What is the value of x?

6. The segment is a median of the triangle. What is the value of x?

7. The dashed segment is an altitude of the triangle. What is the value of x?

8. Match the point of concurrency with the concurrent segments that created them.

   A) circumcenter   1) median

   B) incenter   2) altitude

   C) centroid   3) angle bisector
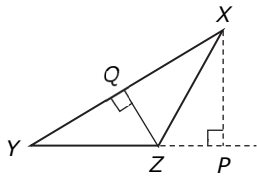
   D) orthocenter   4) perpendicular bisector

9. Name a point of concurrency that has each property.

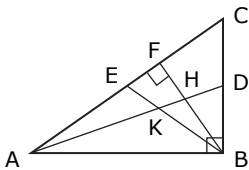   A) equidistant from sides

   B) equidistant from vertices

10. In $\triangle JKL$, T is the centroid. What are KT and TN if $KN = 15$?
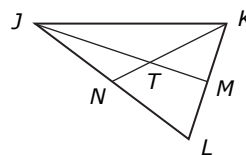
11. Name all altitudes of $\triangle XYZ$.

12. In $\triangle ABC$, D and E are midpoints of sides $\overline{BC}$ and $\overline{AC}$ respectively. Name all medians and the centroid of $\triangle ABC$.
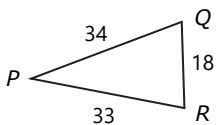

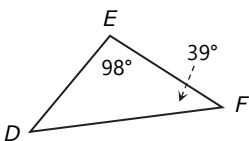**13.** Name all altitudes and the orthocenter of $\triangle ABC$ above.

14. Which lengths <u>cannot</u> form a triangle?

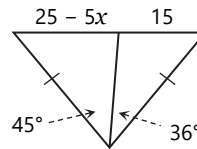A) 3, 4, 5   B) 6, 8, 8

C) 5, 5, 10   D) 7, 8, 9

15. Order the angles of $\triangle PQR$ from smallest to largest.

16. Order the sides of $\triangle DEF$ from shortest to longest.
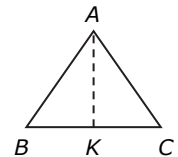

17. Two sides of a triangle measure 10 and 15. Find the range for the length of the third side.

18. Find the possible values of x. Remember that side lengths are positive.

19. Complete the proof that a median of an isosceles triangle is also an angle bisector.

<u>Given:</u> $\overline{AB} \cong \overline{AC}$
        $\overline{AK}$ is a median.

<u>Prove:</u> $\overline{AK}$ bisects $\angle A$.

STATEMENTS	REASONS
1. $\overline{AB} \cong \overline{AC}$ $\overline{AK}$ is a median.	1. Given
2. K is the midpoint of $\overline{BC}$.	2. Def. of ?
3. $\overline{BK} \cong \overline{CK}$	3. Def. of ?
4. $\overline{AK} \cong \overline{AK}$	4.
5. $\triangle ABK \cong \triangle ACK$	5.
6. $\angle BAK \cong \angle CAK$	6.
7. $\overline{AK}$ bisects $\angle A$.	7. Def. of ?

20. (HONORS) Prove that the hypotenuse is always the longest side of a right triangle.

<u>Given:</u> $m\angle C = 90°$

<u>Prove:</u> $AB > BC$,
         $AB > AC$