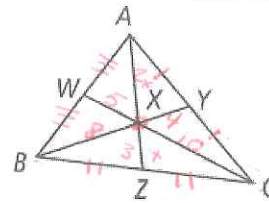


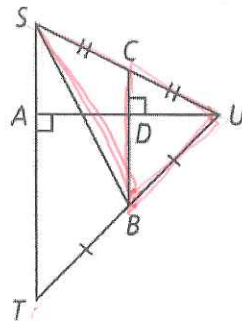
5.4 In $\triangle ABC$, X is the centroid.

1. If $CW = 15$, find CX and XW .
 $\frac{10}{5}$
2. If $BX = 8$, find BY and XY .
 $\frac{12}{4}$
3. If $XZ = 3$, find AX and AZ .
 $\frac{6}{9}$



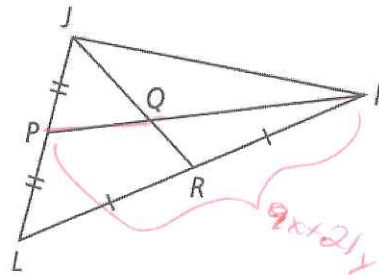
In Exercises 7-10, name each segment.

7. a median in $\triangle STU$ \overline{SB}
8. an altitude in $\triangle STU$ \overline{UA}
9. a median in $\triangle SBU$ \overline{CB}
10. an altitude in $\triangle CBU$ \overline{UD}



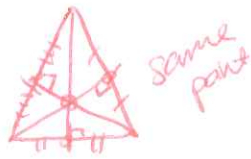
11. Q is the centroid of $\triangle JKL$. $PK = 9x + 21y$.
 Write expressions to represent PQ and QK .

$PQ = \frac{1}{3}(9x + 21y) = 3x + 7y$
 $QK = \frac{2}{3}(9x + 21y) = 6x + 14y$



Draw a triangle that fits the given description. Then construct the centroid and the orthocenter.

12. equilateral $\triangle CDE$



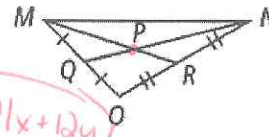
13. acute isosceles $\triangle XYZ$



21. In which kind of triangle is the centroid at the same point as the orthocenter?
equilateral

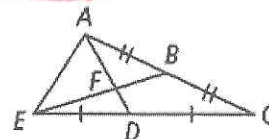
22. P is the centroid of $\triangle MNO$. $MP = 14x + 8y$. Write expressions to represent PR and MR .

$PR = \frac{14x + 8y}{2} = 7x + 4y$ $MR = 21x + 12y$

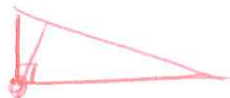


23. F is the centroid of $\triangle ACE$. $AD = 15x^2 + 3y$. Write expressions to represent AF and FD .

$AF = 10x^2 + 2y$ $FD = 5x^2 + y$



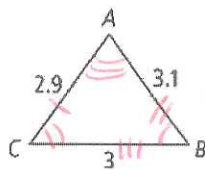
24. Explain where the orthocenter is located on a right triangle and why. (draw a diagram to demonstrate as well)



at vertex of rt. \angle b/c the 2 legs are 2 of the altitudes.

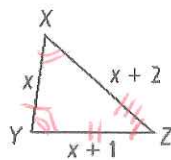
5.6 - List the angles in order from least to greatest for #3-4.

3.



$\angle B, \angle C, \angle A$

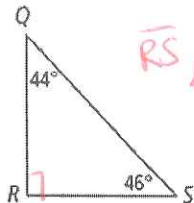
4.



$\angle Z, \angle X, \angle Y$

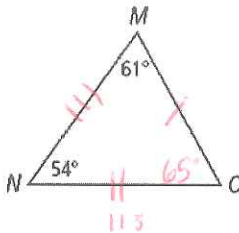
For Exercises 7-10, list the sides of each triangle in order from shortest to longest.

7.



$\overline{RS}, \overline{QR}, \overline{QS}$

8.



$\overline{MO}, \overline{NO}, \overline{MN}$

9. $\triangle ABC$, with $m\angle A = 99$, $m\angle B = 44$, and $m\angle C = 37$

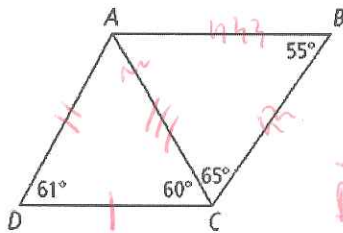
$\overline{BA}, \overline{AC}, \overline{BC}$

10. $\triangle ABC$, with $m\angle A = 122$, $m\angle B = 22$, and $m\angle C = 36$

$\overline{AC}, \overline{AB}, \overline{BC}$

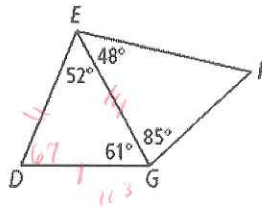
Determine which side is shortest in the diagram.

13.



\overline{BC}

14.



\overline{EG}

Can a triangle have sides with the given lengths? Explain.

15. 8 cm, 7 cm, 9 cm

$8 + 7 = 15$ $15 > 9$ (yes)

16. 7 ft, 13 ft, 6 ft

$7 + 6 = 13$ $13 = 13$ (No)

17. 20 in., 18 in., 16 in.

$18 + 16 = 34$ $34 > 20$ (yes)

18. 3 m, 11 m, 7 m

$3 + 7 = 10$ $10 < 11$ (No)

Algebra The lengths of two sides of a triangle are given. Describe the possible lengths for the third side.

19. 5, 11

$6 < x < 16$

20. 12, 12

$0 < x < 24$

21. 25, 10

$15 < x < 35$

24. **Algebra** List the sides in order from shortest to longest in $\triangle ABC$, with

$m\angle A = 80$, $m\angle B = 3x + 5$, and $m\angle C = 5x - 1$.

41

59

$5x - 1 + 3x + 5 + 80 = 180$

$8x + 4 = 100$

$8x = 96$

$x = 12$

$\overline{AC}, \overline{AB}, \overline{BC}$

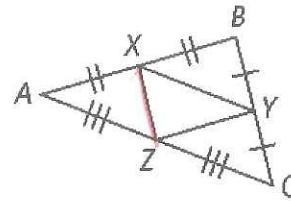
25. **Error Analysis** A student draws a triangle with a perimeter 36 cm. The student says that the longest side measures 18 cm. How do you know that the student is incorrect? Explain.

Other 2 sides would have to add up to 18, but need to add to greater than 3 side.

5.1-5.4, 5.6 Mixed Review

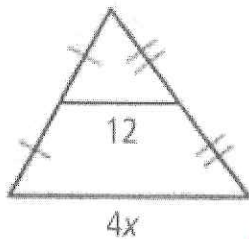
1. Using the diagram to the right, answer the following:

- a. $\overline{XZ} \parallel \underline{\overline{BC}}$
- b. $\overline{AB} \parallel \underline{\overline{ZY}}$
- c. $\angle A \cong \underline{\angle XYZ}$ or $\angle YZC$
- d. $\overline{BY} \cong \underline{\overline{YC}} \cong \underline{\overline{XZ}}$
- e. $2(ZY) = \underline{AB}$



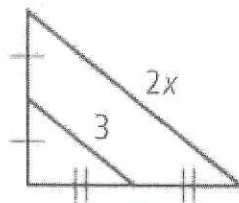
2. Find the value of x .

a.



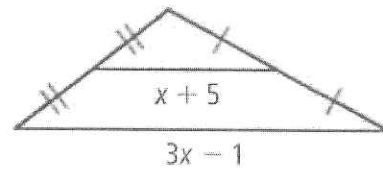
$2(12) = 4x$ $x = 6$
 $24 = 4x$

b.



$2(3) = 2x$
 $6 = 2x$
 $x = 3$

c.



$2(x+5) = 3x-1$
 $2x+10 = 3x-1$
 $11 = x$

3. Use the figure below to answer the following questions.

a. Find YZ .

104

b. $AX = 26$ and $BZ = 36$. Find the perimeter of $\triangle XYZ$.

$104 + 88$
 192

c. Which angle is congruent to $\angle XBA$? How do you know?

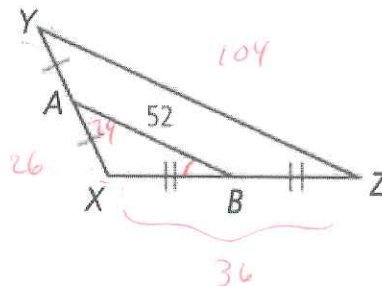
$\angle BZY$

Corresp \angle 's \cong b/c $\overline{AB} \parallel \overline{YZ}$

d. If $m\angle Y = 74^\circ$ and $m\angle ABX = 21^\circ$, what is $m\angle X$?

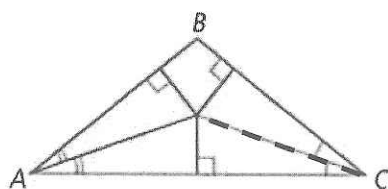
$74 + 21 + x = 180$
 $95 + x = 180$

$x = 85^\circ$



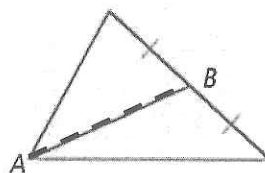
4. For the following triangles, state if the dotted line is a *perpendicular bisector*, an *angle bisector*, a *median*, an *altitude* or *none of these*. Explain.

a.



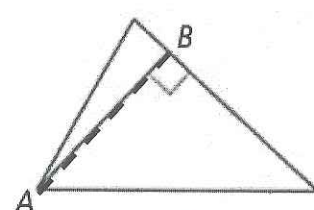
\angle bisector

b.



median

c.



altitude

5. Explain the similarities and differences between an triangle's altitude and median.

~~Alt~~
 Both through vertex,
 Alt \perp to opp side
 median through midpt.

6. In a(n) equilateral triangle, all the special points of concurrency are the same point.

7. The sides of $\triangle DEF$ are the midsegments of $\triangle ABC$. The sides of $\triangle GHI$ are the midsegments of $\triangle DEF$.

a. Which sides, if any, of $\triangle GHI$ and $\triangle ABC$ are parallel?

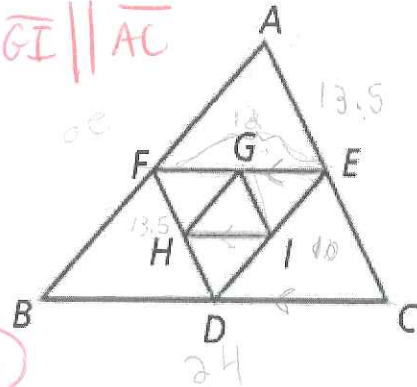
$\overline{HI} \parallel \overline{BC}$; $\overline{HG} \parallel \overline{AB}$; $\overline{GI} \parallel \overline{AC}$

b. What are the relationships between the side lengths of $\triangle GHI$ and $\triangle ABC$?

$\frac{1}{4}$

c. If $FE = 12$, $DE = 10$ and $AE = 13.5$, find the perimeter of $\triangle DEF$ and $\triangle ABC$.

$10 + 12 + 13.5 = 35.5$



8. In $\triangle RST$, $m\angle R = 70$ and $m\angle S = 80$. List the side of $\triangle RST$ in order from shortest to longest.

$m\angle T = 30$

\overline{SR} , \overline{ST} , \overline{RT}

9. Is it possible for a triangle to have sides with the given lengths? Explain.

a. 5 in, 8 in, 15 in

$5 + 8 = 13$
 $13 < 15$ **NO**

b. 10 cm, 20 cm, 12 cm

$10 + 12 = 22$
 $22 > 20$ **yes**

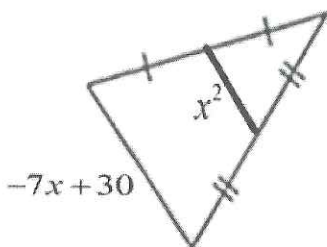
10. The lengths of two sides of a triangle are 12 ft and 13 ft. Find the range of possible lengths for the third side.

$1 < x < 25$

11. The lengths of two sides of a triangle are 21 cm and 15 cm. Find the range of possible lengths for the third side.

$6 < x < 36$

12. Solve for x.



$2x^2 = -7x + 30$

$2x^2 + 7x - 30 = 0$

$(2x - 5)(x + 6) = 0$

$x = -6, \text{ or } 5/2$