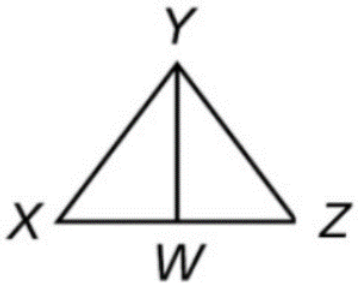
Station 1: Proof Practice

Use the statements and reasons provided to complete the proof. **Mark the diagram first!**

Given: $\overline{WY}$ is an altitude of ΔXYZ
$\overline{WY}$ is an angle bisector ΔXYZ

Prove: $\angle X \cong \angle Z$



Statements				
$\overline{WY} \cong \overline{WY}$	$\overline{WY} \perp \overline{XZ}$	$\angle YWX \cong \angle YWZ$	$\overline{WY}$ is an altitude of ΔXYZ	$\angle YWX$ and $\angle YWZ$ are right angles
$\overline{WY}$ is an angle bisector ΔXYZ	$\Delta XYW \cong \Delta ZYW$	$\angle X \cong \angle Z$	$\angle XYW \cong \angle ZYW$	

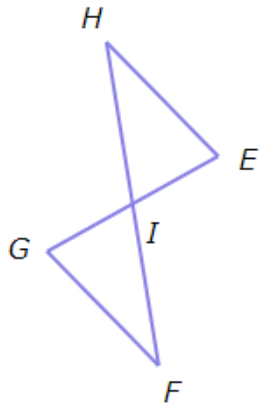
Reasons		
Given	CPCTC	Reflexive POC
If two segments are perpendicular, then they form right angles	If two angles are right angles, then they are congruent	If a segment is an angle bisector, then it divides an angle into 2 congruent angles
Given	If corresponding ASA of two triangles are congruent, then the triangles are congruent	If a segment is an altitude of a triangle, then it is perpendicular to a side of the triangle

Statements	Reasons
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.

Fill in the blanks to complete the proof. **Mark the diagram first!**

Given: I is the midpoint of $\overline{EG}$
$\angle E \cong \angle G$

Prove: $\overline{EG}$ bisects $\overline{HF}$

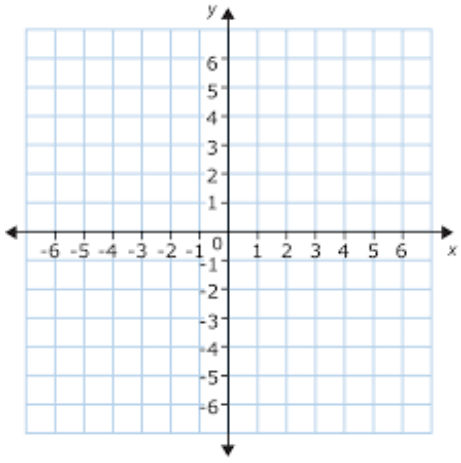


Statements	Reasons
1. I is the midpoint of $\overline{EG}$	1.
2.	2. If a point is a midpoint of a segment, then _____ _____
3. $\angle E \cong \angle G$	3. Given
4. $\angle GIF$ and $\angle EIH$ are vertical angles	4.
5.	5. If two angles are vertical angles, then _____
6. Δ_____ $\cong \Delta$_____	6. If corresponding _____ of two triangles are congruent, then the triangles are congruent
7. $\overline{IH} \cong \overline{IF}$	7.
8. $\overline{EG}$ bisects $\overline{HF}$	8. If a segment divides a segment into two congruent segments, then _____.

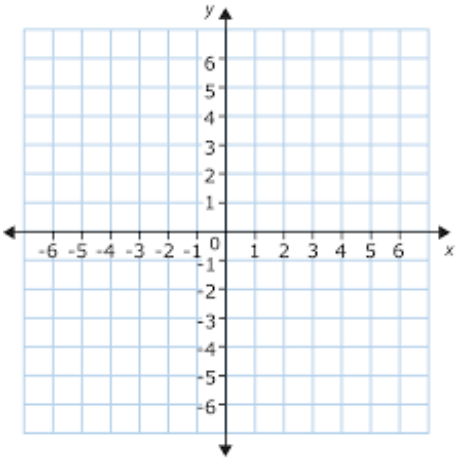
Station 2: Drawing Special Segments

1. **Fill in the blanks to review how to draw each special segment.**
   - To draw a median of a triangle, you need to find the _____ of the opposite side. The median has endpoints at a _____ of the triangle and the midpoint of the opposite side.
   - To draw an altitude, you need to find the _____ of the opposite side. Begin at the vertex of a triangle and use the _____ _____ slope of the opposite side to draw the altitude.
   - To draw a perpendicular bisector of a side of a triangle, you need to find the midpoint and the _____ of the side. Begin at the _____ and use the opposite _____ slope of the side to draw the perpendicular bisector.

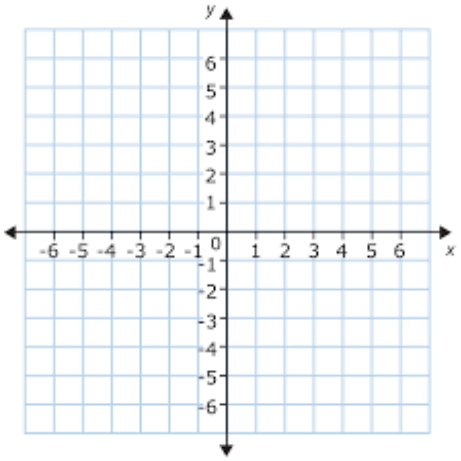
2. The vertices of Δ*PQR* are at *P*(3, -1), *Q*(0, -2), and *R*(-4, 4). Graph Δ*PQR* and label its vertices. Then draw median $\overline{PM}$. Label *M*.



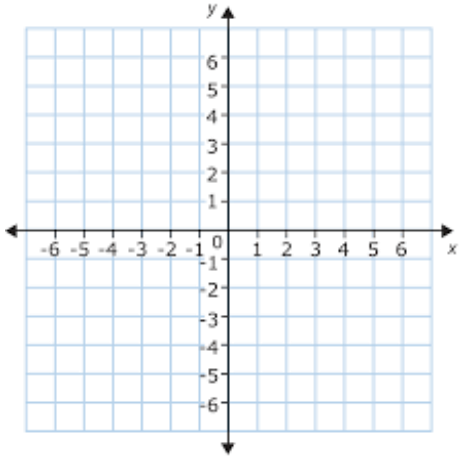
3. The vertices of Δ*ABC* are at *A*(2, 3), *B*(5, 1), and *C*(1, -3). Graph Δ*ABC* and label its vertices. Then draw altitude $\overline{AH}$. Label *H*.



4. The vertices of Δ*PQR* are at *P*(0, 0), *Q*(2, 6), and *R*(5, 5). Graph Δ*PQR* and label its vertices. Then draw the perpendicular bisector of $\overline{PQ}$.



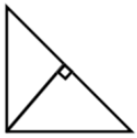
5. The vertices of Δ*STU* are at *S*(-4, 2), *T*(1 -1), and *U*(-4, -4). Graph Δ*STU* and label its vertices. Then draw the altitude from *T*.



What is the length of the altitude from *T*? _____

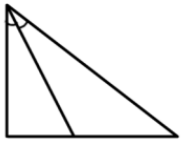
Station 3: Finding Missing Values with Special Segments

1. Identify each special segment as a median, angle bisector, perpendicular bisector, or altitude.

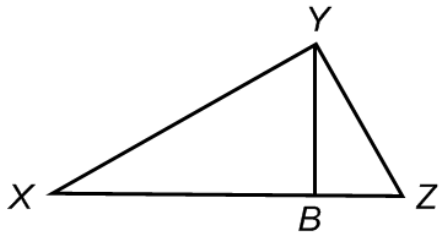
a) 

b) 

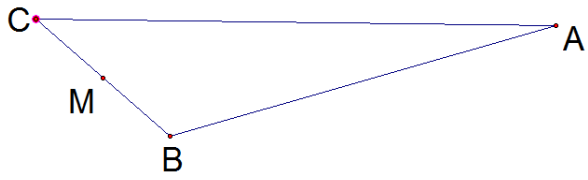
c) 

d) 

2. $\overline{YB}$ is an altitude of ΔXYZ and $m\angle YBZ = (7x+27)°$. Find the value of x.

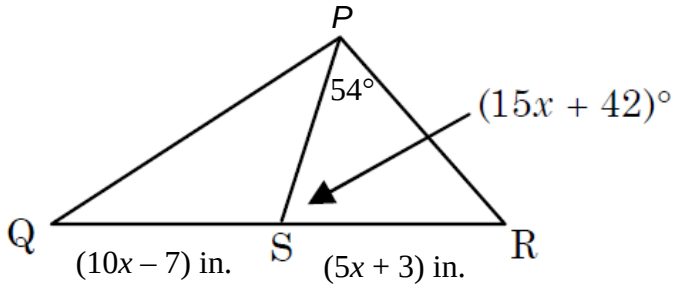


3. $\overline{AM}$ is a *median* of ΔABC. Draw the median in the diagram. If $BM = 10x - 8$ and $CM = 3x + 34$, find the value of x and CB.



x = _____ CB = _____

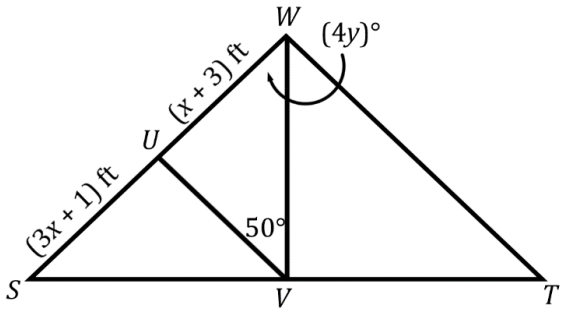
4. Given $\overline{PS}$ is a median. Find $m\angle PSR$.



$m\angle PSR$ = _____ Classify ΔPRS by angles and sides: _____ _____

5. In a diagram shown, $\overline{UV}$ is a perpendicular bisector of ΔSVW and $\overline{WV}$ is an angle bisector of ΔSWT.

Mark the diagram with the given information and then solve for x, y, *and* $m\angle SWT$.



$m\angle SWT$ = _____

Station 4: The Triangle Inequality Theorem

Is it possible to form a triangle with the given side lengths? If not, explain why not.

1. 2 *ft*, 3 *ft*, 4 *ft*
2. 2 *m*, 12 *m*, 10 *m*
3. 7.5 *in*, 9 *in*, 1 *in*

Find the range for the measure of the third side of a triangle given the measures of two sides.

4. 5 *ft*, 9 *ft*
5. 7 *in*, 14 *in.*

Find the range of possible measures of x if each set of expressions represents measures of the sides of a triangle.

6. $(x + 1)$ yds., 5 yds., 7 yds.
7. 12 ft, 20 ft, $(2k + 4)$ ft

Station 4: The Triangle Inequality Theorem

Is it possible to form a triangle with the given side lengths? If not, explain why not.

1. 2 *ft*, 3 *ft*, 4 *ft*
2. 2 *m*, 12 *m*, 10 *m*
3. 7.5 *in*, 9 *in*, 1 *in*

Find the range for the measure of the third side of a triangle given the measures of two sides.

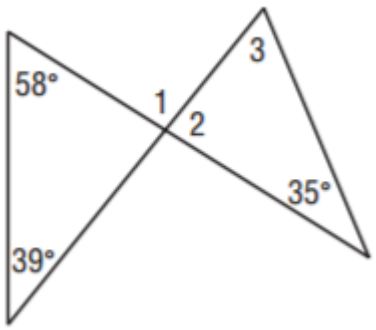
4. 5 *ft*, 9 *ft*
5. 7 *in*, 14 *in.*

Find the range of possible measures of x if each set of expressions represents measures of the sides of a triangle.

6. $(x + 1)$ yds., 5 yds., 7 yds.
7. 12 ft, 20 ft, $(2k + 4)$ ft

Station 5: Angle-Side Theorem & Exterior Angle Theorem

1. Find the indicated angle measures.



$m\angle 1$= _____

$m\angle 2$= _____

$m\angle 3$= _____

2. Fill in the blank with ***sometimes, always, or never***.

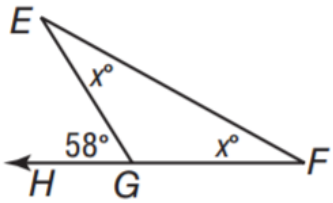
   a. The acute angles of a right triangle are _____ supplementary.

   b. The acute angles of a right triangle are _____ complementary.

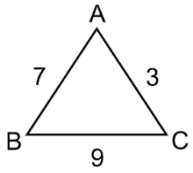
   c. There can _____ be two right angles in a triangle.

   d. A right triangle is _____ an isosceles triangle.

3. Find $m\angle F$.

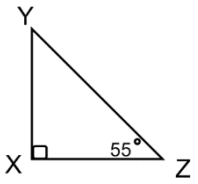


4. List the angles in order from *smallest to largest.*



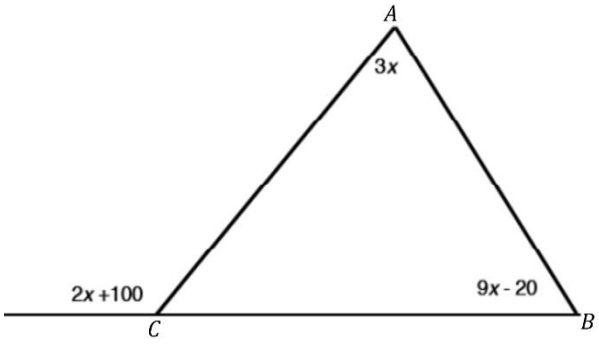
_____, _____, _____

5. List the sides in order from *smallest to largest.*



_____, _____, _____

6. Find the value of *x* and the following angle measures.



x = _____

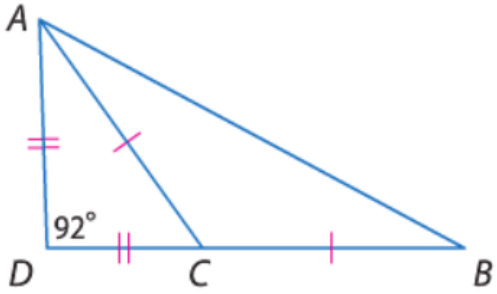
$m\angle A$ = _____ $m\angle B$ = _____ $m\angle ACB$ = _____

exterior angle = _____

Classify ΔABC: _____ _____

Station 6: Isosceles and Equilateral Triangles

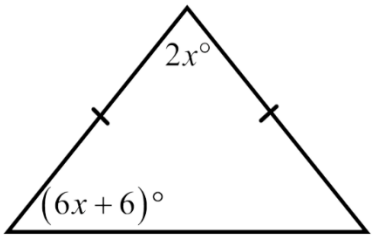
1. Find the indicated angle measures.



$m\angle CAD$ = _____ $m\angle ACD$ = _____

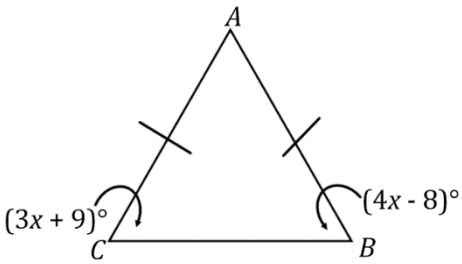
$m\angle ACB$ = _____ $m\angle ABC$ = _____

2. Find the value of x. Then classify the triangle by its sides and angles.



x = _____ Classification: _____ _____

3. Find the value of x. Then classify the triangle by its sides and angles.

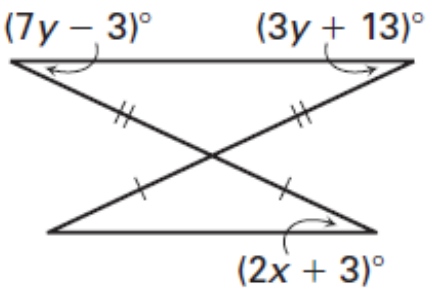


x = _____ $m\angle A$ = _____ Classification: _____ _____

4. ΔFGH is an equilateral triangle with $FG = (x + 5)\ in.$, $GH = (3x - 9)\ in.$ and $FH = (2x - 2) in.$ Find the value of x and FG. (Draw a diagram to help!)

x = _____ FG = _____

5. Find the values of x and y in the diagram shown.



x = _____ y = _____