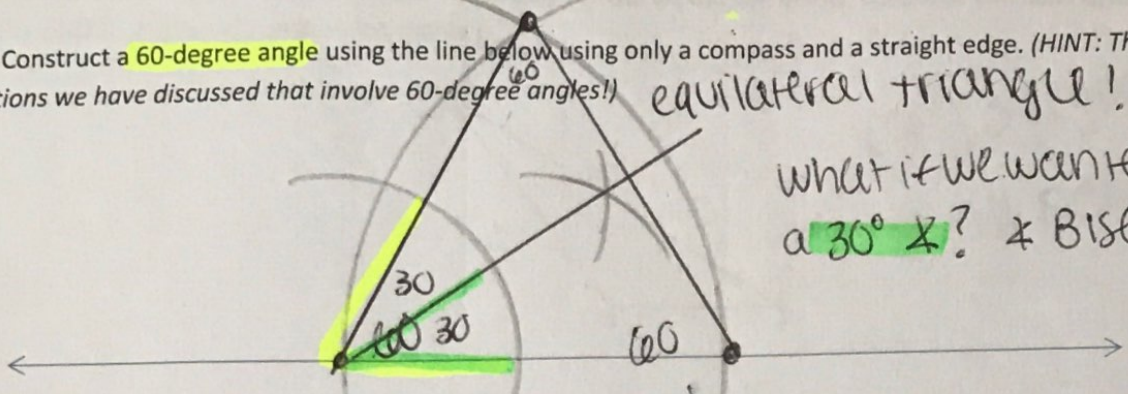


AIM: HOW DO WE CONSTRUCT ANGLES AND TRIANGLES?

Do Now: Construct a 60-degree angle using the line below using only a compass and a straight edge. (HINT: Think of prior constructions we have discussed that involve 60-degree angles!)

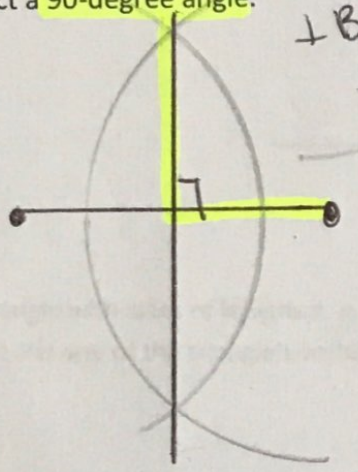


what if we wanted to make a 30° ~~x~~? ~~x~~ Bisector!

CONSTRUCTING SPECIAL ANGLES/TRIANGLES!

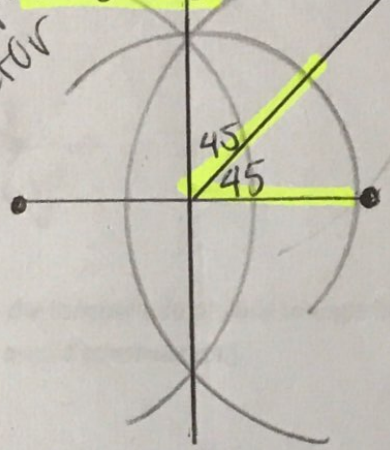
1. Use the Do-Now and your knowledge of constructions to construct a 30-degree angle (on the same diagram).

2. Construct a 90-degree angle.



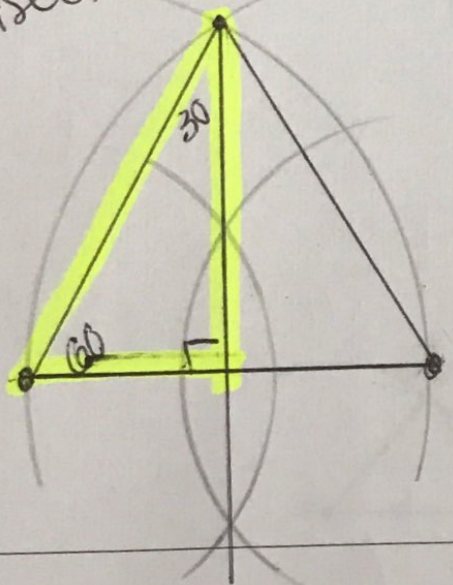
3. Construct a 45-degree angle.

+ Bisector  
 + 4 bisector



4. Construct a 30° - 60° - 90° triangle.

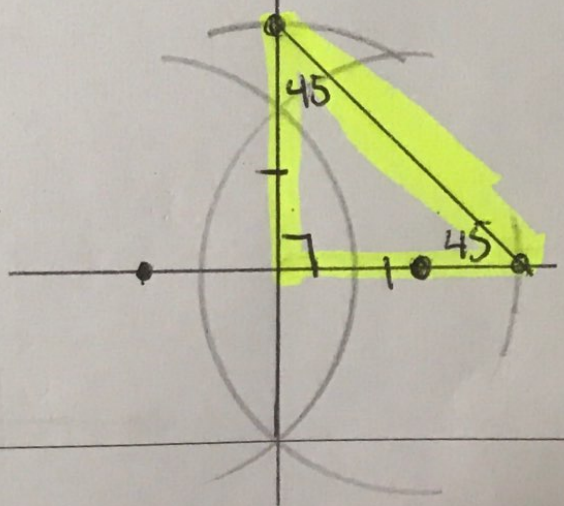
① equilateral Δ  
 ② ⊥ bisector



5. Construct a 45° - 45° - 90° triangle.

① ⊥ line  
 ② 2 ≅ segments

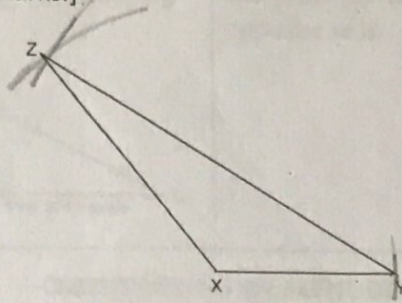
ISOSCELES Δ!



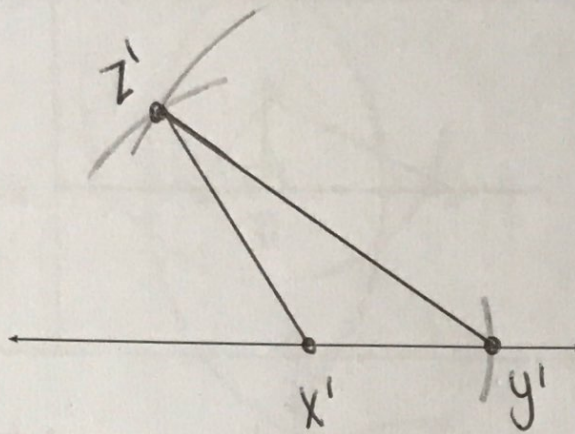


## CONSTRUCTING ANY TRIANGLE

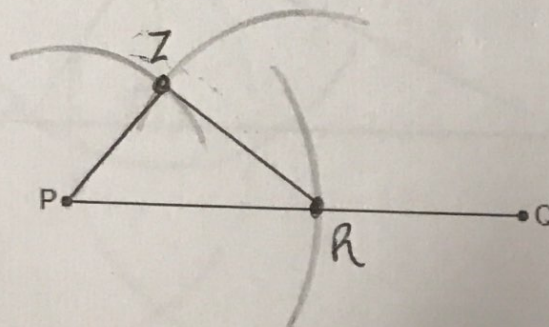
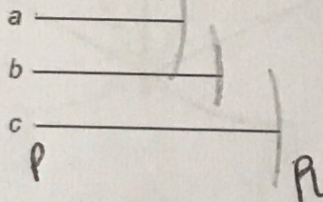
1. Triangle  $XYZ$  is shown below. Using a compass and straightedge, on the line below, construct and label  $\triangle ABC$ , such that  $\triangle ABC \cong \triangle XYZ$ . [Leave all construction marks.]



*copy 3 segments  
so all sides are  $\cong$*



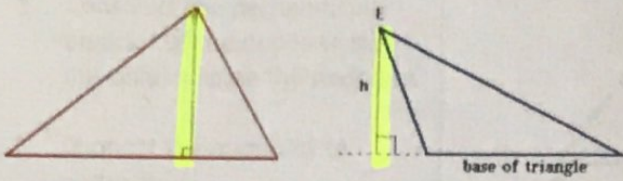
2. Construct a triangle with sides of lengths  $a$ ,  $b$ , and  $c$ , as shown below. Be sure the longest side of your triangle lies on  $\overline{PQ}$  and that point  $P$  is one of the triangle's vertices. [Show all arcs necessary for a valid construction.]



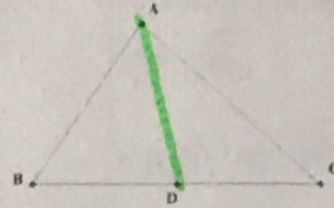


## ALTITUDES VS. MEDIANS

An altitude of a triangle is a line segment through a vertex and perpendicular to a line containing the base.



A median of a triangle is a line segment that joins the vertex of a triangle to the midpoint of the opposite side.

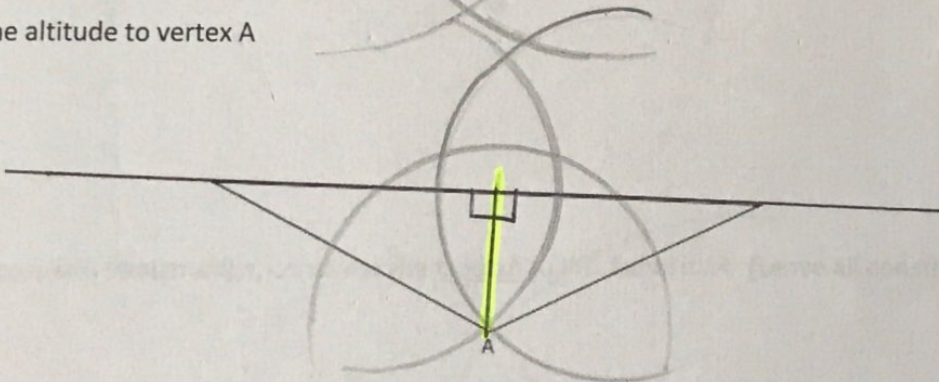


### CONSTRUCTING AN ALTITUDE

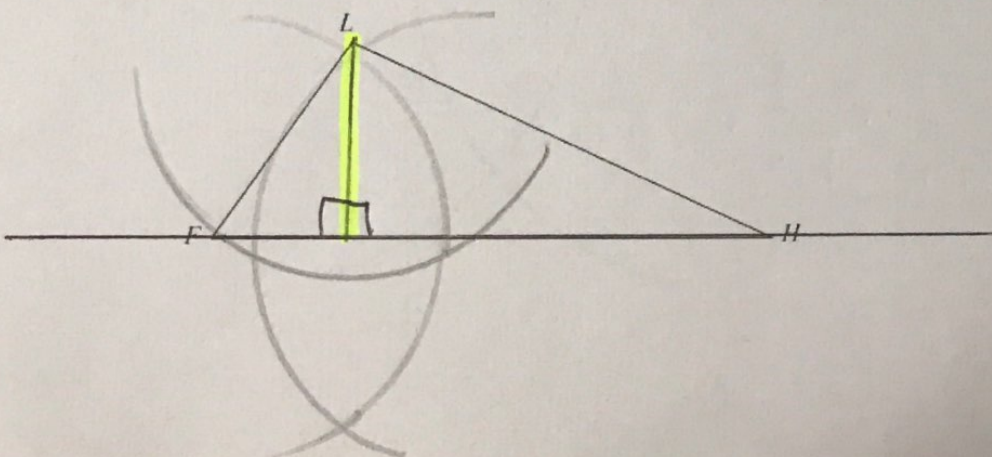
STEPS	EXAMPLE	CONCLUSIONS
<p>Draw an altitude to vertex B.</p> <ol style="list-style-type: none"> <li>With your straight edge, extend the side opposite.</li> <li>Construct a perpendicular line through vertex B.</li> </ol> <p><i>*semicircle!*</i></p>		<ul style="list-style-type: none"> <li><math>\angle BDA</math> &amp; <math>\angle BDC</math> are right <math>\angle</math>'s</li> <li><math>\angle BDA \cong \angle BDC</math></li> </ul>

#### PRACTICE:

- Construct the altitude to vertex A

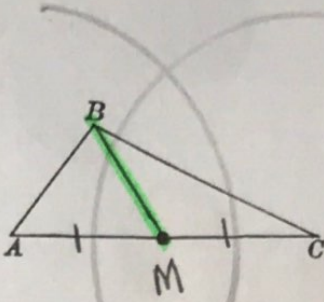


- Using a compass and straightedge, construct the altitude to  $FH$ . Label it A. [Leave all construction marks.]



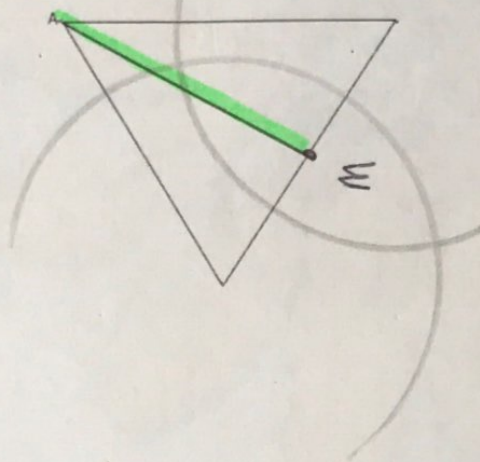


## CONSTRUCTING A MEDIAN

STEPS	EXAMPLE	CONCLUSIONS
<p>Draw a median to vertex B.</p> <ol style="list-style-type: none"> <li>1. Construct the perpendicular bisector of the opposite side but only indicate the midpoint.</li> <li>2. Connect the midpoint to vertex B.</li> </ol>		<ul style="list-style-type: none"> <li>• M is the midpoint of <math>\overline{AC}</math></li> <li>• <math>\overline{AM} \cong \overline{MC}</math></li> </ul>

**PRACTICE:**

1. Construct the median for vertex A.



2. Using a compass and straightedge, construct the median to  $\overline{FH}$ . Label it  $M$ . [Leave all construction marks.]

