Example 3a

a) Construct a triangle with sides measuring 7 cm, 4 cm, and 5 cm.

STRATEGY

Constructing a Triangle Using a Ruler and a Compass

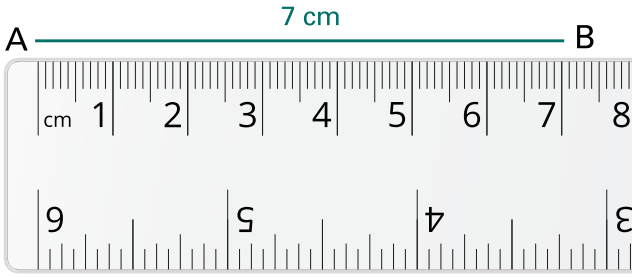
When all side lengths of a triangle are known but the angles are unknown, a ruler and a compass can be used to construct the triangle.

The distance between any point on a circle and its center is constant. So, a triangle with a side of 7 cm is necessarily on a circle with a distance of 7 cm between its centre and its side.

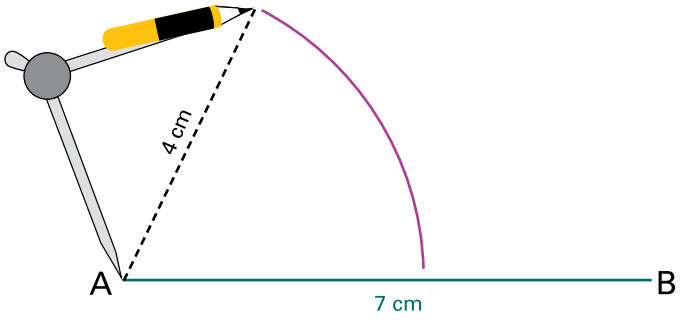
The vertex of the triangle is where 2 circles intersect.

Here are the steps I need to follow to construct my triangle:

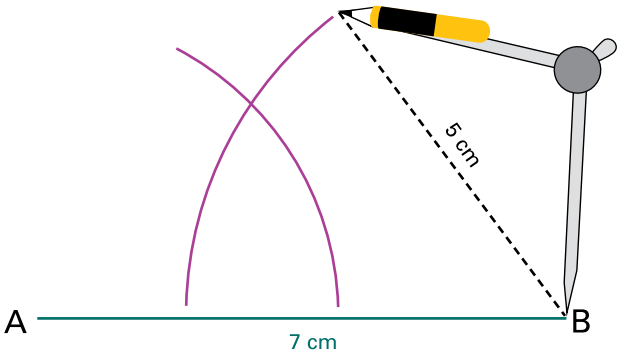
1. Using a ruler, I draw a 7 cm segment (segment AB), which is the length of one of the triangle's sides.



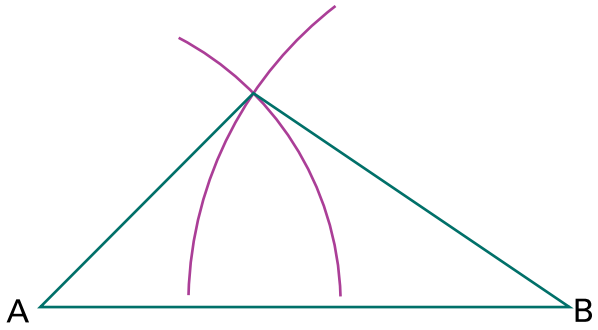
2. I set the compass for the length of another side (4 cm). I place the compass at one of the ends of segment AB and draw an arc.



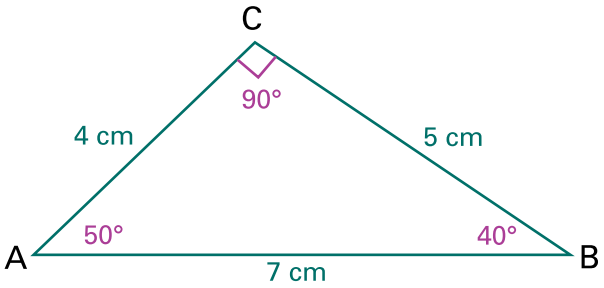
3. I set the compass for the length of the third side (5 cm). I place the compass at the other end of segment AB and draw an arc.



4. The sides can be completed by drawing a line from the ends of the original line to the point of intersection of the arcs.



5. I verify the measurements of the 3 angles using a protractor. Triangle ABC is a right-angle triangle since it has a 90° angle.



6. Using a ruler, I measure the length of the three sides of triangle ABC. Triangle ABC is a scalene triangle since it has no equal sides.