SUBJECT: MATHEMATICS

TOPIC: CONSTRUCTION

SUBTOPIC: MENSURATION AND GEOMETRY

CLASS: JSS2

OBJECTIVE

Construct triangles given:

(a) 2 sides and an included angle.

(b) (b) 2 angles and a side between them.

(c) (c) All the 3 sides.

Bisect any given angles.

A construction in Mathematics is an accurate drawing of angles and lines.

The following instruments are use in constructions:

- A compass with a pencil,
- A ruler
- A protractor.

A Pair of Compass

A pair of compasses (or a compass) is an instrument used for drawing circles and in constructions.

A compass has two legs.

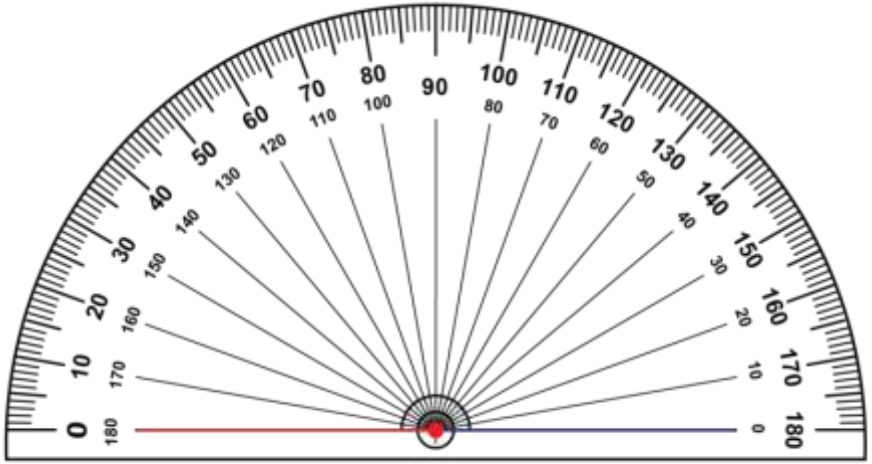
A Ruler

A ruler is use in constructions to draw a straight lines.

Most of us do not have a straightedge, so we use a ruler instead.

A Protractor

We use a protractor to measure or draw an angle. We measure angles in degrees.



Construct a triangle given two sides and an included angle

Included angle

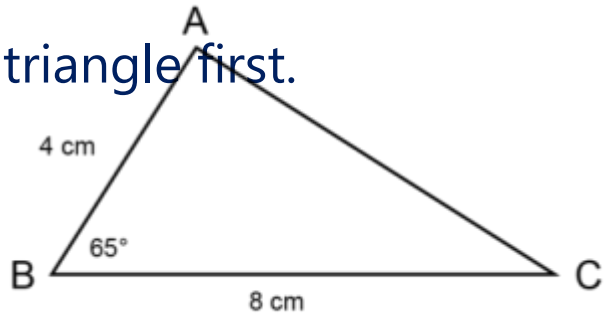
An included angle is the angle between two sides of a triangle.

Question 1

Construct $\triangle ABC$ with $AB = 4$ cm, $A\hat{B}C = 65^\circ$ and $BC = 8$ cm

Solution

Make a rough sketch of the triangle first.

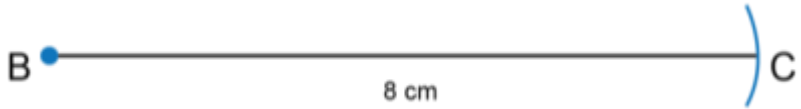


Draw a line segment and mark the first side of triangle.

Begin the construction with line segment *BC*

Draw a line segment (longer than 8 cm) and make a dot at point *B*

Use the compass to measure a length of 8 cm on your ruler.



Use a protractor to draw the included angle.

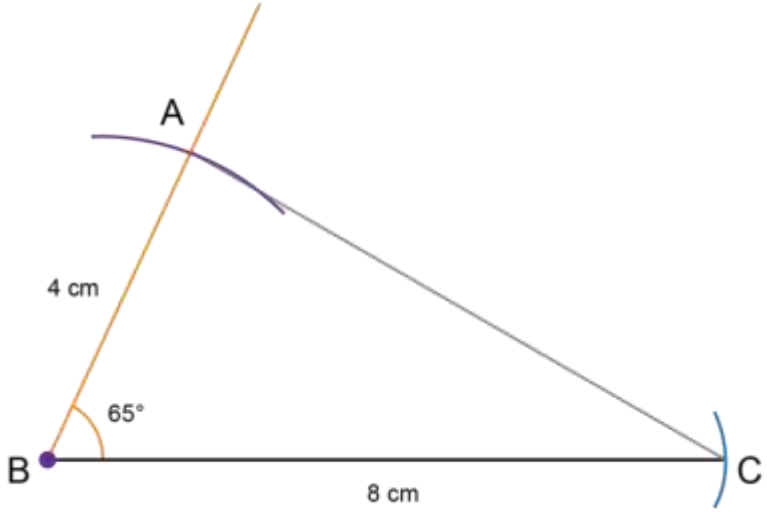
Put the origin of the protractor on point *B*

Measure length of the second side of triangle.

Use the compass to measure a length of 4 cm on your ruler.

Complete the construction.

Use a ruler to join point *A* and point *C*.



Construct a triangle given two angles and the side between them

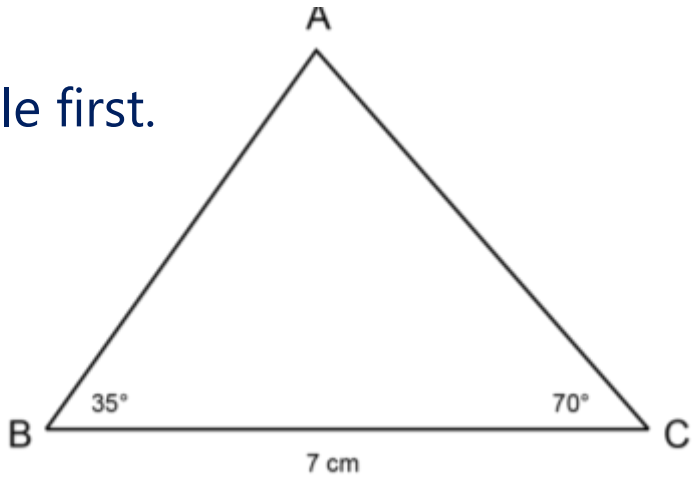
Question 2

Construct $\triangle ABC$ with $\hat{B} = 35^{o}$, $BC = 7$ cm and $\hat{C} = 70^{o}$

Solution

Make a rough sketch of the triangle first.

Label the vertices of the triangle.

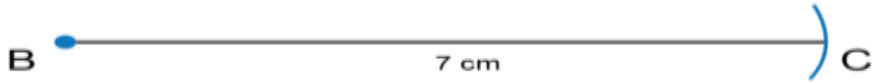


Start with the given line length.

Begin the construction with line segment *BC*

Draw a line segment (longer than 7 cm) and make a dot at point *B*

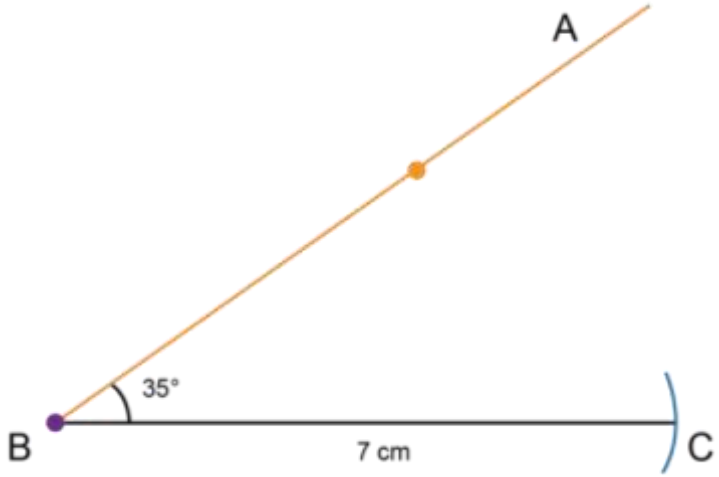
Use the compass to measure a length of 7 cm on your ruler.



Use a protractor to draw the first angle.

Put the origin of the protractor on point *B*

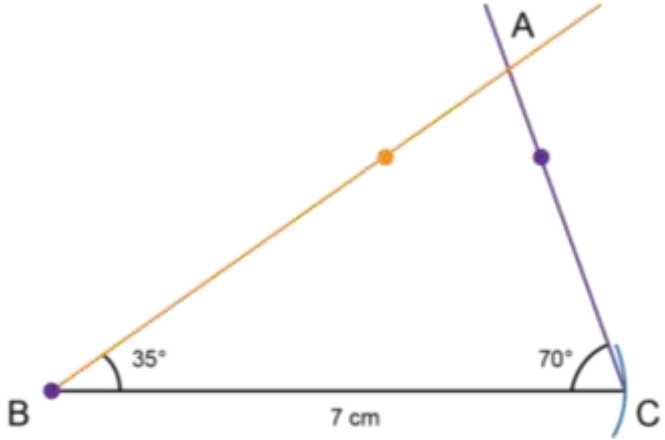
Make sure that *BC* fits exactly onto the base line of the protractor.



Use a protractor to draw the second angle.

Put the origin of the protractor on point *C*

Make sure that *BC* fits exactly onto the base line of the protractor.



Construct a triangle given all three sides

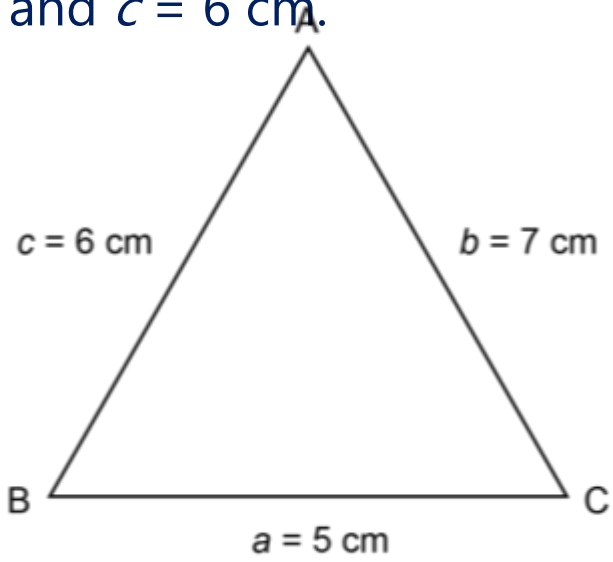
Question 3

Construct $\triangle ABC$ with $a = 5$ cm, $b = 7$ cm and $c = 6$ cm.

Solution

Make a rough sketch of the triangle first.

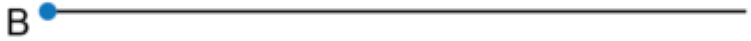
Label the vertices of the triangle.



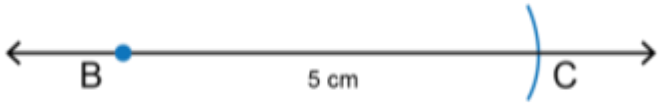
Draw a line segment and mark first side of triangle.

Begin the construction with line segment *BC*

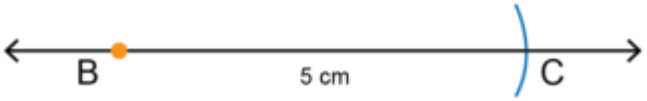
Draw a line segment (longer than 5 cm) and make a dot at point *B*



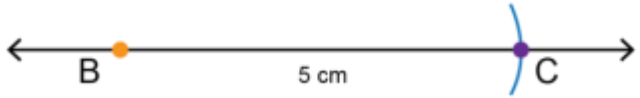
Use the compass to measure a length of 5 cm on your ruler.

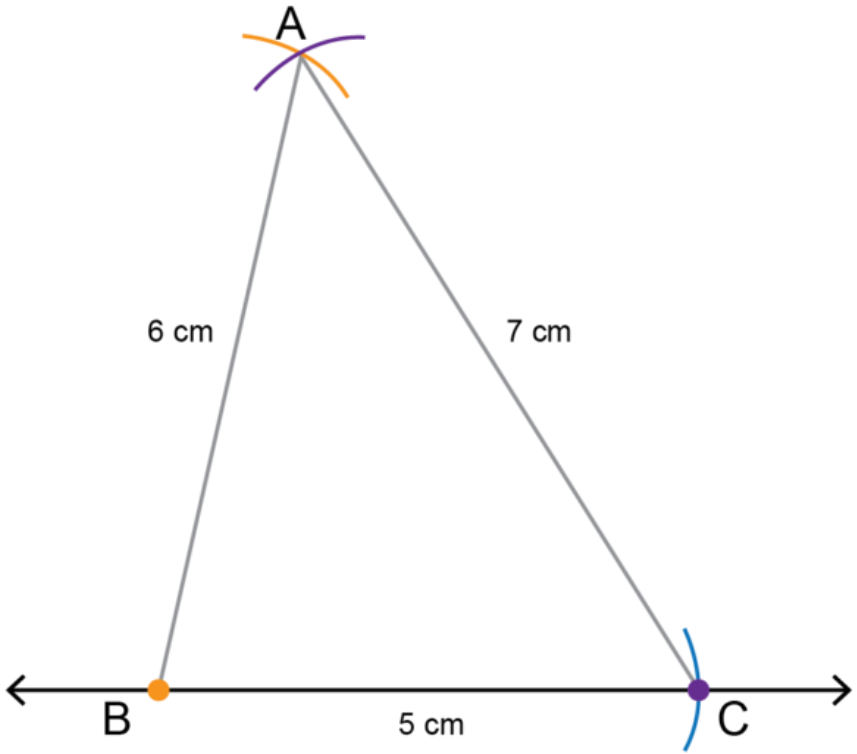


Draw an arc to mark the length of the second side of the triangle.



Draw an arc to mark the length of the third side of the triangle.




A
6 cm
7 cm
B
5 cm
C

Bisect angles

Bisect

When we bisect an angle, we divide the angle into two equal halves.

Bisector

The bisector (or angle bisector) is the line that divides an angle into two equal halves.

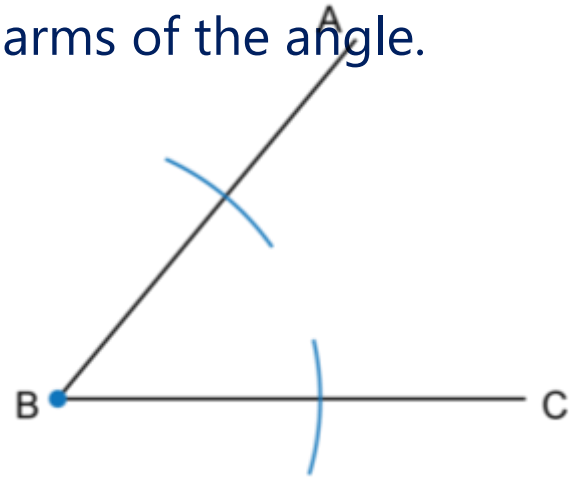
Question 4

AB^ *C* is an acute angle. Use a compass and a ruler to bisect ^AB*C*.

Solution

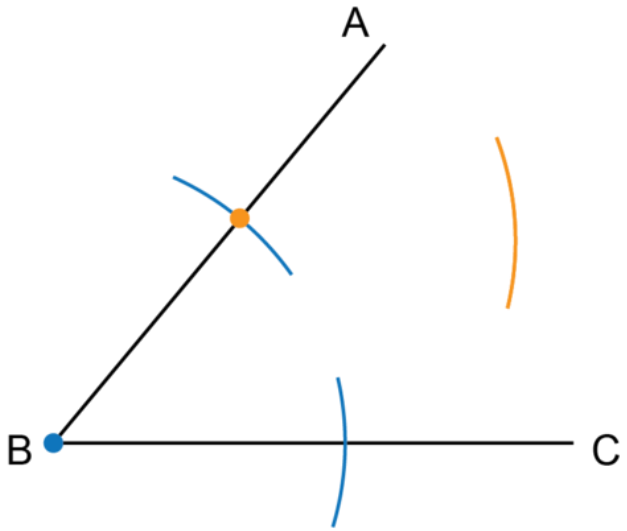
Draw the first two arcs.

Put the compass on point *B* (the blue dot). Point *B* is the vertex of the angle. Keep the compass at the same width and draw two arcs to intersect with the two arms of the angle.



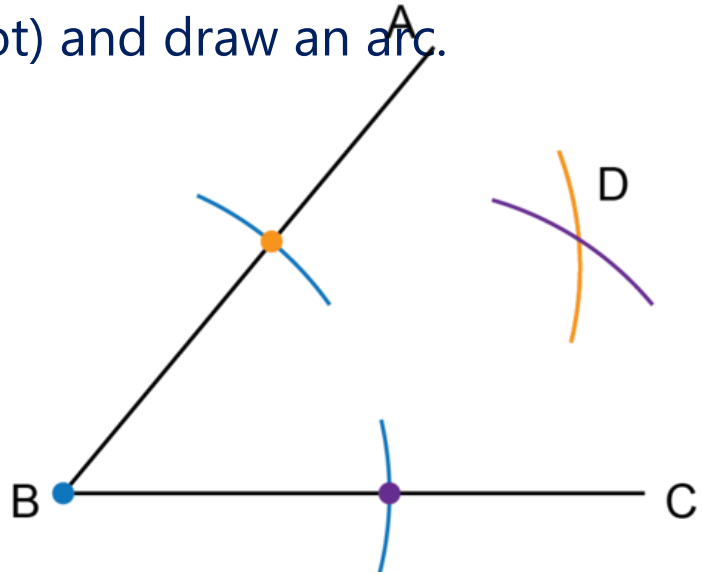
Draw the third arc.

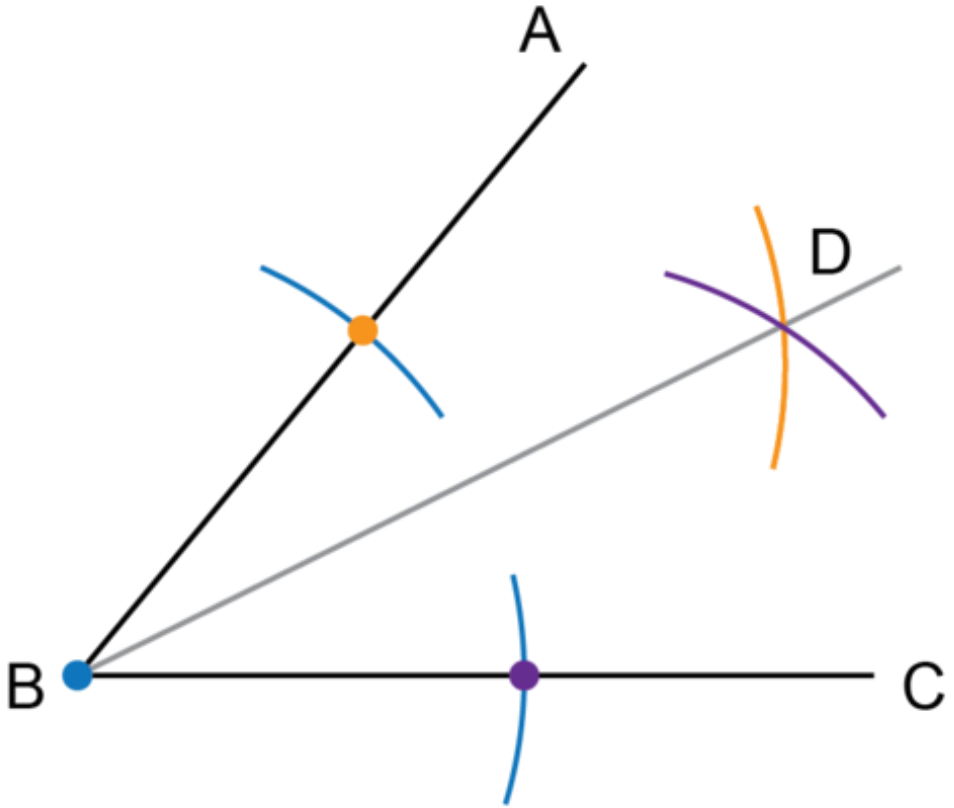
Put the compass on the point where the arc from Step 1 crosses *AB* (the orange dot) and draw an arc.



Draw the fourth arc.

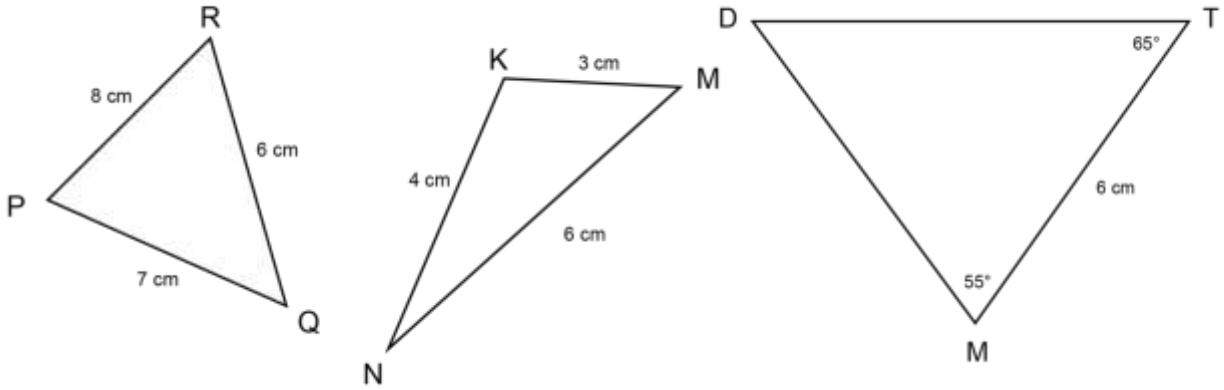
Keep the compass at the same width as for Step 2. Put the point of the compass on the point where the arc from Step 1 crosses *BC*. (the purple dot) and draw an arc.




A
D
B
C

EVALUATION

Construct the following triangles



– Thank You –