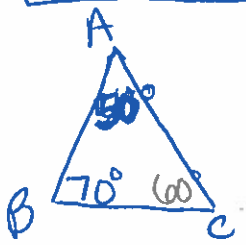
Triangle Inequality Theorem and Triangles in Spherical Geometry (5.7 & 3.9)

Possible lengths of 3rd side:

{diff < x < sum}

Ex 10 cm, 5 cm

5cm < x < 15cm



Sides sm → Big

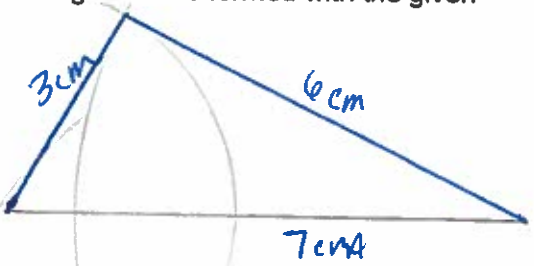
$\overline{BC}$, $\overline{AB}$, $\overline{AC}$

To be or not to be???

Use constructions to verify if a triangle can be formed with the given side lengths or not.

1. 3 cm, 6 cm and 7 cm

yes △



2. 3 cm, 5 cm and 8 cm

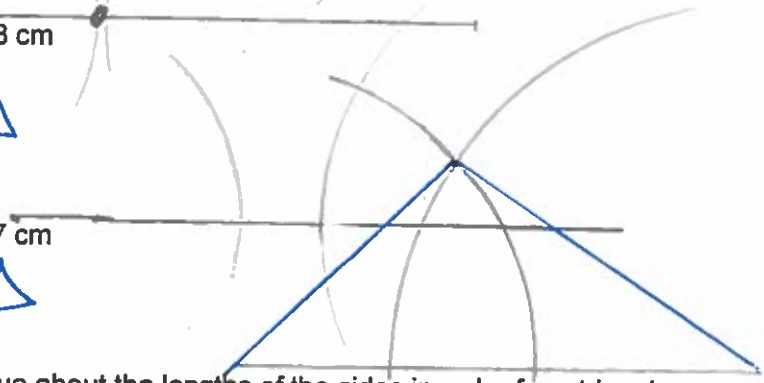
No △

3. 3 cm, 4 cm, 8 cm

NO △

4. 4 cm, 5 cm, 7 cm

yes △

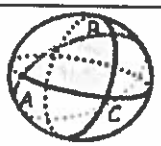
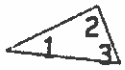
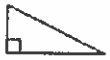
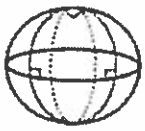
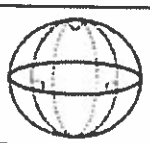


What must be true about the lengths of the sides in order for a triangle to be formed?

→ Any 2 sides of △ must Add to more than the third.

→ *2 short sides must add to more than the longest side.

Spherical Geometry VS Euclidean Geometry:

Euclidean Geometry		Spherical Geometry	
3 non-collinear points form a triangle		3 non-collinear points form a triangle	
Triangle sum is 180°.		Triangle sum is greater than 180 and less than 540	
A triangle can have one obtuse angle (one right angle)		A triangle can have more than one obtuse angle (one right angle)	
Each angle measure of an equiangular triangle is 60.		Each angle measure of an equiangular triangle can vary.	

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