Lesson Summary

- Three lengths determine a triangle provided the largest length is less than the sum of the other two lengths.
- Two angle measurements determine a triangle provided the sum of the two angle measurements is less than $180°$.
- Three given angle measurements do not determine a unique triangle.
- Scale drawings of a triangle have equal corresponding angle measurements, but corresponding side lengths are proportional.

Problem Set

1. Decide whether each set of three given lengths determines a triangle. For any set of lengths that does determine a triangle, use a ruler and compass to draw the triangle. Label all side lengths. For sets of lengths that do not determine a triangle, write "Does not determine a triangle," and justify your response.
   a. 3 cm, 4 cm, 5 cm
   b. 1 cm, 4 cm, 5 cm
   c. 1 cm, 5 cm, 5 cm
   d. 8 cm, 3 cm, 4 cm
   e. 8 cm, 8 cm, 4 cm
   f. 4 cm, 4 cm, 4 cm

2. For each angle measurement below, provide one angle measurement that will determine a triangle and one that will not determine a triangle. Provide a brief justification for the angle measurements that will not form a triangle. Assume that the angles are being drawn to a horizontal segment AB; describe the position of the non-horizontal rays of angles $\angle A$ and $\angle B$.

$\angle A$	$\angle B$: A Measurement That Determines a Triangle	$\angle B$: A Measurement That *Does Not* Determine a Triangle	Justification for No Triangle
$40°$			
$100°$			
$90°$			
$135°$			

3. For the given side lengths, provide the minimum and maximum whole number side lengths that determine a triangle.

Given Side Lengths	Minimum Whole Number Third Side Length	Maximum Whole Number Third Side Length
5 cm, 6 cm		
3 cm, 7 cm		
4 cm, 10 cm		
1 cm, 12 cm		