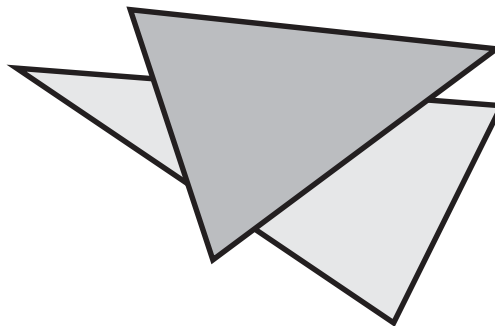


## Activity 14



# Triangle inequality

### Objectives

1. To verify that the sum of any two sides of a triangle is always greater than the third side.
2. To verify that the difference of any two sides of a triangle is always less than the third side.

### Pre-requisite knowledge

Measurements and comparison of line segments.

### Material Required

Chart paper, pencil, ruler and broom sticks.

### Procedure

Get sticks of different lengths. Take three at a time. For example:

Set I (4cm, 5cm, 10cm)  
(3cm, 5cm, 9cm)  
(5cm, 6cm, 14cm)

Set II (5cm, 5cm, 10cm)  
(6cm, 6cm, 12cm)  
(4cm, 4cm, 8cm)

Set III (5cm, 6cm, 10cm)  
(7cm, 8cm, 10cm)  
(8cm, 9cm, 14cm)

For each triplet of numbers in a given set above, try to form triangle.

### Observations

Observe the lengths that form the triangles. See Figs 14 (a), 14 (b) and 14 (c). The students will notice that a triangle is possible only if the sum of any two sides of a triangle is greater than the third side. In each possible case, they will notice that the difference of any two sides is less than the third.

### Learning Outcomes

The students learn that with any three line segments, you cannot always construct a triangle. The given lengths must satisfy the condition that (a) the sum of any two sides of a triangle is always greater than the third side and (b) the difference of any two sides is less than the third side.

### Remark

The conditions have to be satisfied for every pair of sides of a triangle. Also if condition (a) is satisfied (b) is automatically satisfied and vice-versa.

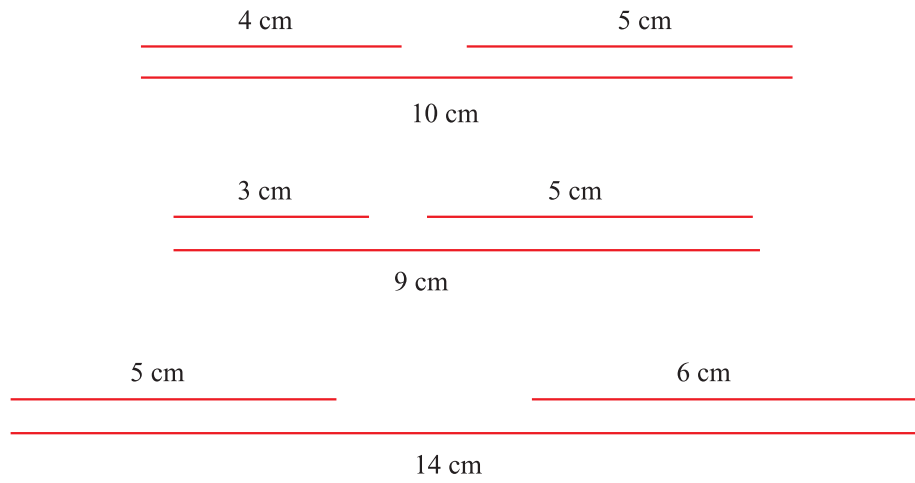


Fig 14 (a)

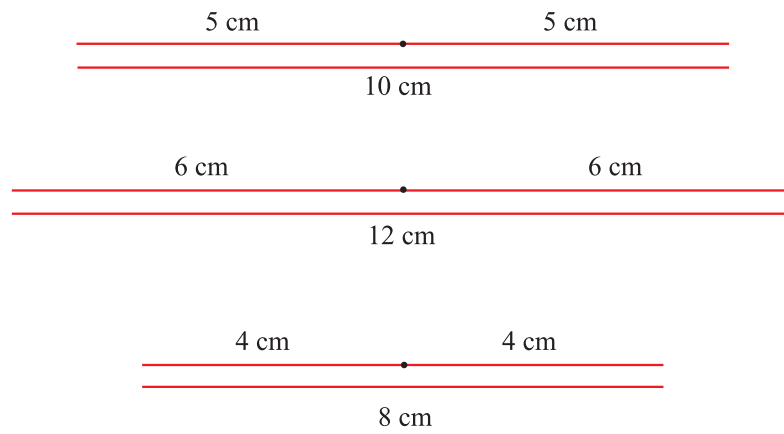


Fig 14 (b)

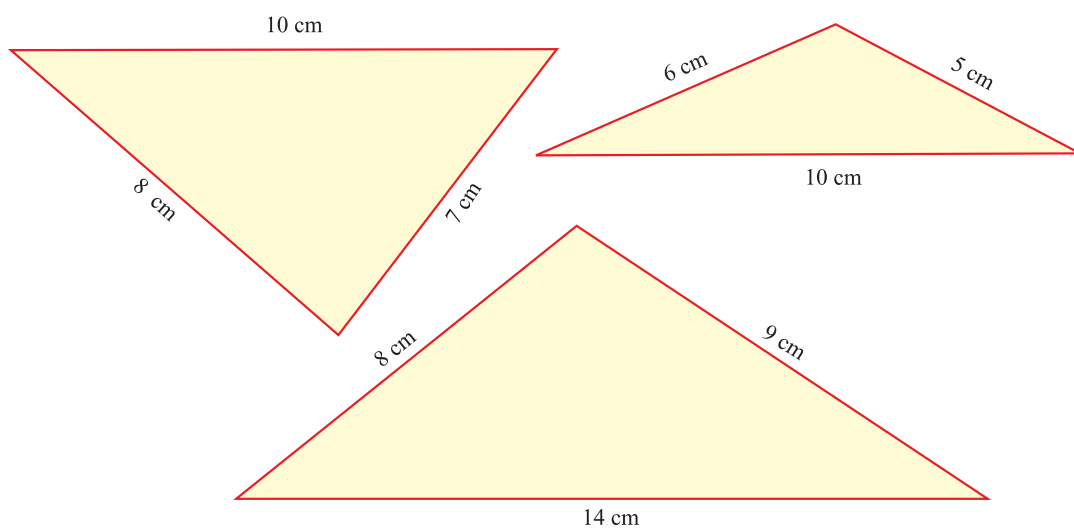


Fig 14 (c)