



ACTIVITY

Relation Of Inequalities In Triangle

Objective

To verify that a triangle is possible only if the sum of any two sides of triangle is always greater than the third side and difference of any two sides is always less than the third side.

Material Required

Broom sticks or straws, scale, geometry box.

Theory

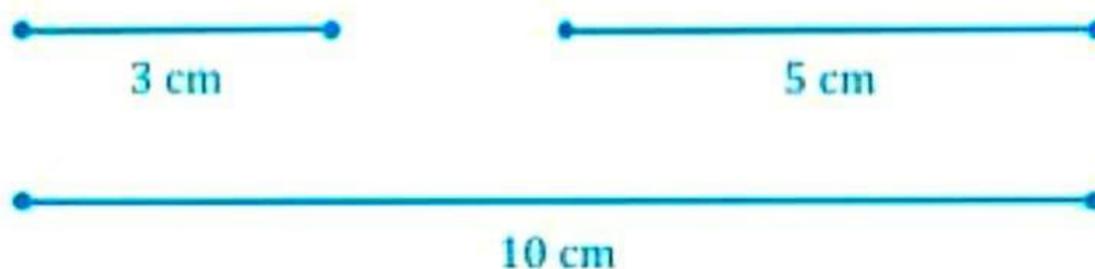
1. Measurement of line segments.
2. Comparison of line segments.

Procedure

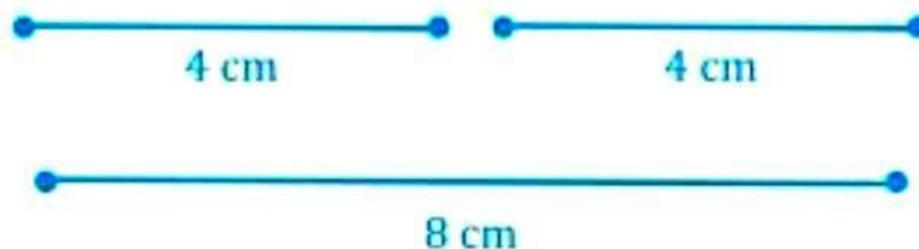
1. Take some sticks according to the given measurements.
2. Collect three triplets of sticks as given.

Set 1:

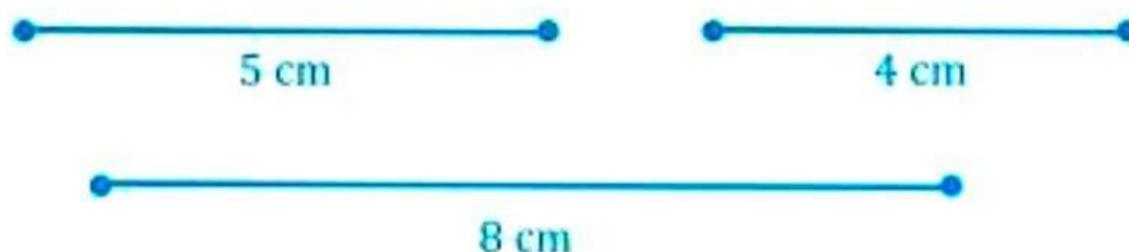
1. 3cm, 5cm, 10cm



2. 4cm, 4cm, 8cm

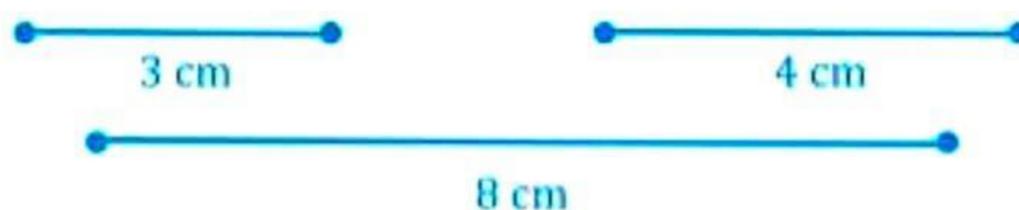


3. 5cm, 4cm, 8cm

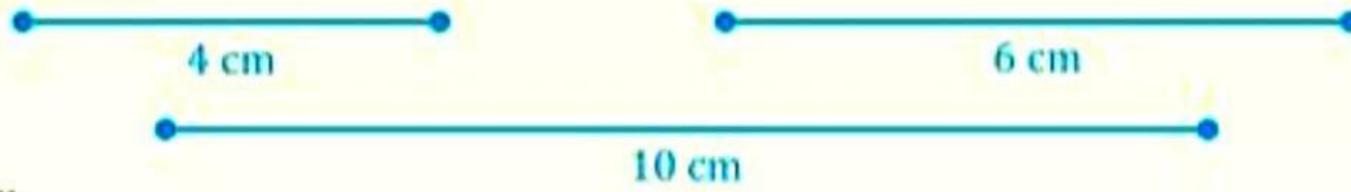


Set 2:

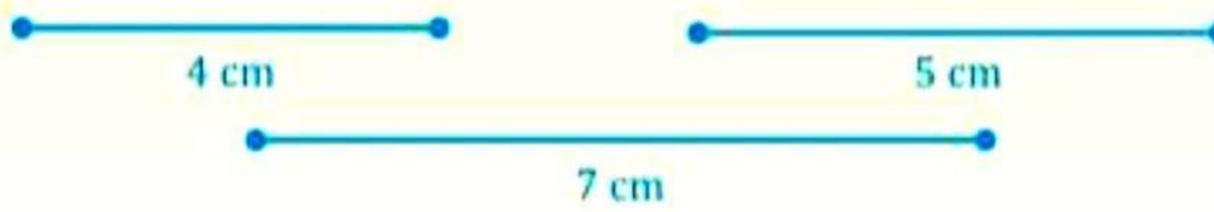
1. 3cm, 4cm, 8cm



2. 4cm, 6cm, 10cm

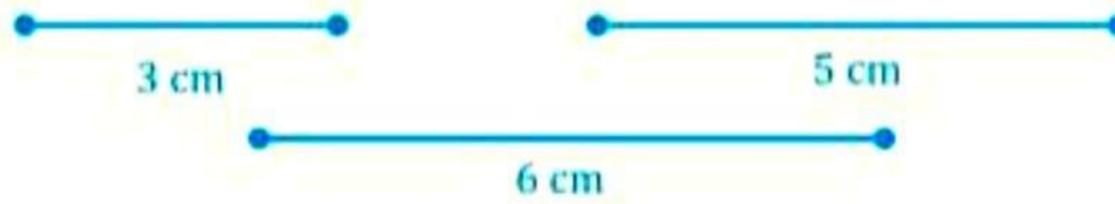


3. 4cm, 5cm, 7cm

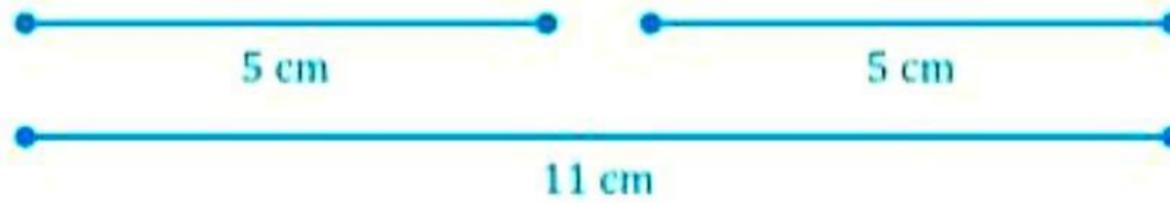


Set 3:

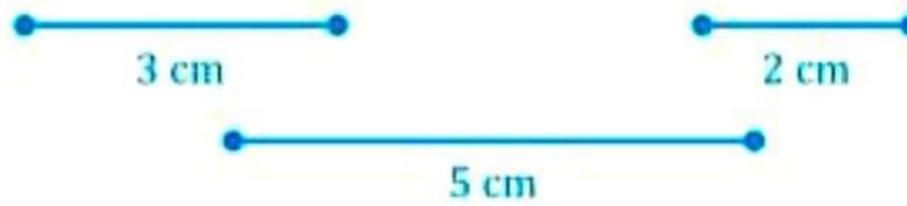
1. 5cm, 3cm, 6cm



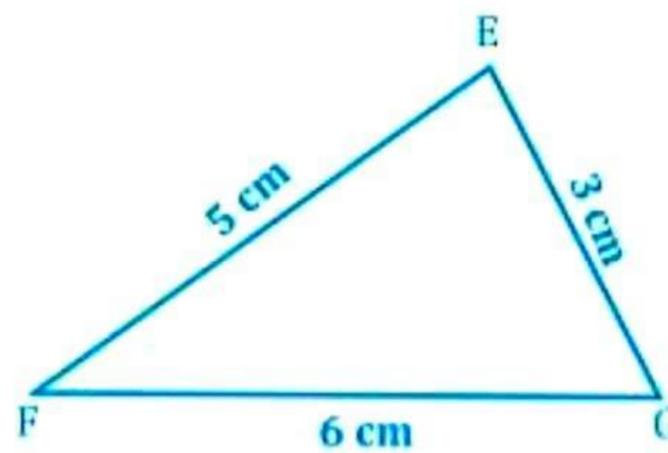
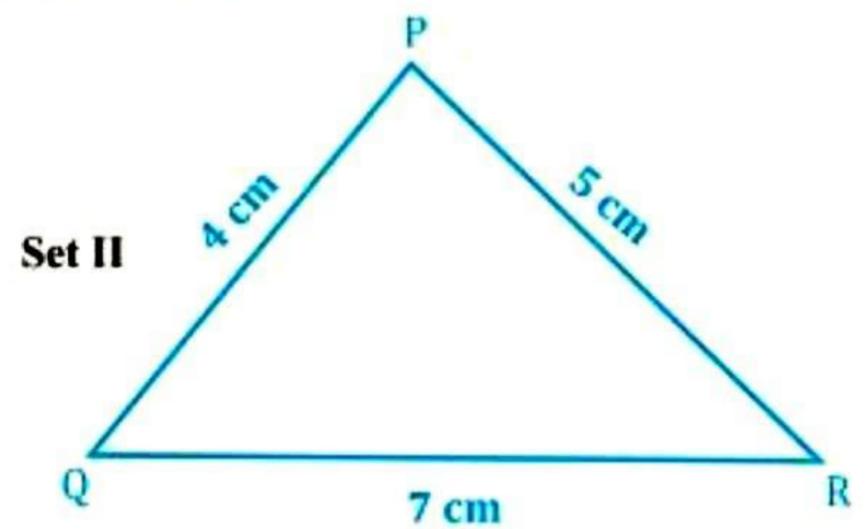
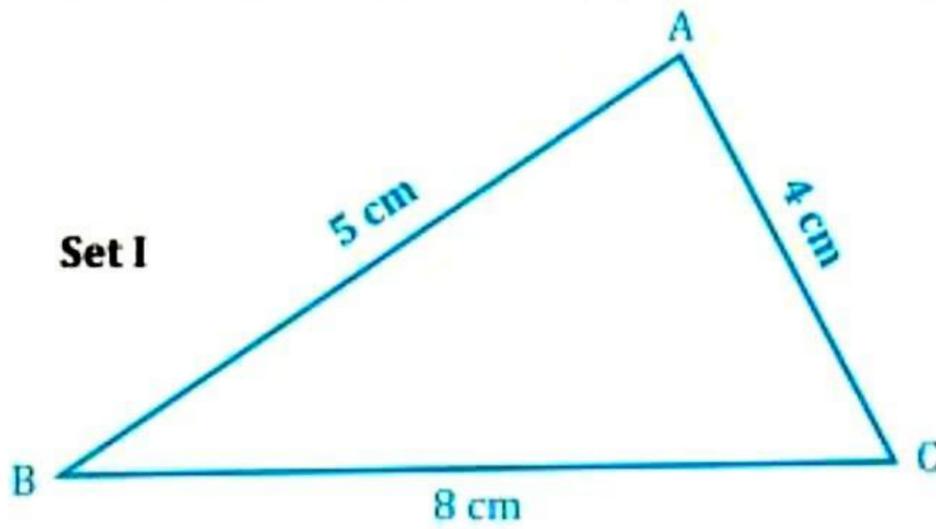
2. 5cm, 5cm, 11cm



3. 3cm, 2cm, 5cm



4. Now from the above three sets, try to form a triangle and name them.



Set III

Observation and Calculation Table

Set	Side 1	Side 2	Side 3	Possibility of Δ	Reason
I					
(i)	3	5	10	not possible	$3 + 5 < 10$
(ii)	4	4	8	not possible	$4 + 4 = 8$
(iii)	5	4	8	possible	$5 + 4 > 8$ $5 + 8 > 4$ $4 + 8 > 5$
II					
(i)	3	4	8	not possible	$3 + 4 < 8$
(ii)	4	6	10	not possible	$4 + 6 = 10$
(iii)	4	5	7	possible	$4 + 5 > 7$ $5 + 7 > 4$ $4 + 7 > 5$
III					
(i)	5	5	11	not possible	$5 + 5 < 11$
(ii)	3	2	5	not possible	$3 + 2 = 5$
(iii)	5	3	6	possible	$5 + 3 > 6$ $5 + 6 > 3$ $3 + 6 > 5$

In each set, we observe that triangle is possible only when the sum of the two sides is greater than the third side.

Result

We verified that the triangle is possible only when the sum of any two sides is greater than the third side.

Learning Outcome

We learnt that, for any three-line segments, we cannot construct a triangle always because for a triangle the sum of any two sides of a triplet is always greater than the third side.

Activity Time

- For a triplet, verify that the difference of any two sides is always less than the third side in a triangle.
- Are the following triangles possible?
 - Right-angled equilateral triangle.
 - Obtuse equilateral triangle.
 - All angles are acute angle.
- Two obtuse angles in a triangle.

Viva Voce

Q1. What is an equilateral triangle?

Ans: Equilateral triangle - having all sides equal.

Q2. What is the sum of an interior angle of a triangle?

Ans: 180°

Q3. State, if the following triangles are possible:

(a) 8cm, 6cm, 11cm

(b) 6cm, 7cm, 13cm,

Ans: (a) Yes (b) No.

Q4. What is an isosceles triangle?

Ans: Isosceles triangle - having any two equal sides

Q5. In an equilateral triangle each angle of:

Ans: 60°

Q6. In an acute angle triangle, each angle of?

Ans: Less than 90°

Q7. What do you mean by line segment?

Ans: A part of a line that is bounded by two distinct end points.

Q8. Is it possible to construct a triangle with sides 4cm, 5cm and 7 cm?

Ans: Yes

Multiple Choice Questions

Q 1. If the semi-perimeter of an equilateral triangle is $28\sqrt{3}$ cm, then its area is:

(a) $784\sqrt{3}$ cm²

(b) $684\sqrt{2}$ cm²

(c) $\frac{784\sqrt{3}}{3}$ cm²

(d) $\frac{684\sqrt{3}}{3}$ cm²

Q 2. Two sides of a triangle are of lengths 5 cm and 1.5 cm. The length of the third side of the triangle cannot be:

(a) 3.6 cm

(b) 4.1 cm

(c) 3.8 cm

(d) 3.4 cm

Q 3. In triangles ABC and PQR, $AB = AC$, $\angle C = \angle P$ and $\angle B = \angle Q$. The two triangles are:

(a) Isosceles but not congruent.

(b) Isosceles but congruent.

(c) Congruent but not isosceles.

(d) Neither congruent nor isosceles.

Q 4. In a $\triangle ABC$, $\angle A = 85^\circ$, $\angle B = 65^\circ$, what will be the least side of $\triangle ABC$?

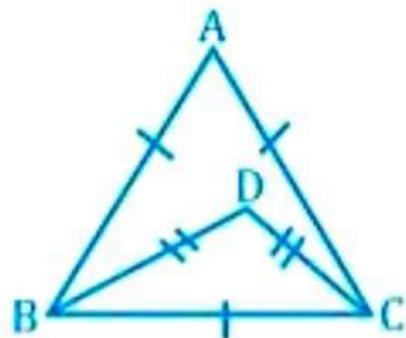
(a) AB

(b) BC

(c) AC

(d) None of these

Q 5. In the given figure, the ratio $\angle ABD : \angle ACD$ is:



(a) 1: 1

(b) 2: 1

(c) 1: 2

(d) None of these

Q 6. Which is the longest side in a right-angled triangle?

(a) Altitude

(b) Base

(c) Hypotenuse

(d) None of these

Q 7. In a scalene triangle:

(a) difference of two sides is greater than the third side

(b) product of two sides is greater than the third side

(c) the sum of two sides is greater than the third side

(d) None of these

Q 8. The three values of angles are 65° , 85° , 30° . Is the triangle possible by using these angles?

(a) Right triangle

(b) Yes

(c) No

(d) None of these

ANSWER KEY

1. (c)

2. (d)

3. (a)

4. (a)

5. (a)

6. (c)

7. (c)

8. (b)