NAME: _____ SECTION: _____

# LESSON 3: TRIANGLE INEQUALITY THEOREM

## I. OBJECTIVES

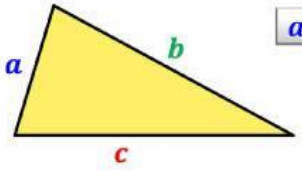
The learner illustrates theorems on triangle inequalities (Exterior Angle Inequality Theorem, Triangle Inequality Theorem, Hinge Theorem). ***M8GE-IVa-1***

- The learner investigates the relationship between the sum of any two sides and the remaining sides in a triangle.

## II. LESSON

### TRIANGLE INEQUALITY THEOREM

The sum of the lengths of any two sides of a triangle is greater than the length of the third side.

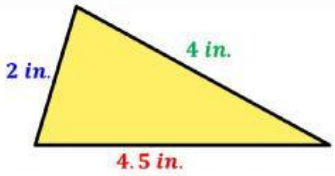



$a + b > c$

$a + c > b$

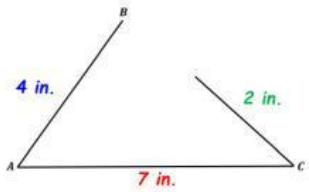
$b + c > a$

**Remember:** To form a triangle, make sure that the sum of the lengths of any two sides of a triangle is greater than the length of the third side.



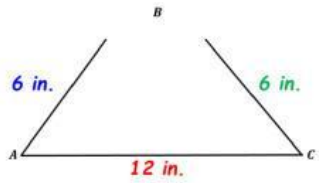

| $a + b > c$ | $a + c > b$ | $b + c > a$ |
|---|---|---|
| $2 + 4 > 4.5$ | $2 + 4.5 > 4$ | $4 + 4.5 > 2$ |
| $6 > 4.5$ ✓ | $6.5 > 4$ ✓ | $8 > 2$ ✓ |

**Remember:** If the sum of the lengths of the two shorter side is less than the length of the longest side, then you will not form a triangle.




| | | |
|---|---|---|
| $AB + BC > AC$ | $4 + 2 > 7$ | $6 > 7$ ✗ |
| $AB + AC > BC$ | $4 + 7 > 2$ | $11 > 2$ ✓ |
| $BC + AC > AB$ | $2 + 7 > 4$ | $9 > 4$ ✓ |

**Remember:** If the sum of the lengths of the two shorter side is less than the length of the longest side, then you will not form a triangle.




| | | |
|---|---|---|
| $AB + BC > AC$ | $6 + 6 > 12$ | $12 > 12$ ✗ |
| $AB + AC > BC$ | $6 + 12 > 6$ | $18 > 6$ ✓ |
| $BC + AC > AB$ | $6 + 12 > 6$ | $18 > 6$ ✓ |

## III. ACTIVITY

***I. Which of the following measures could be the lengths of the sides of a triangle? Select YES if it will form a triangle and NO if it will not form a triangle.***

1. $8\ in., 8\ in., 8\ in.$ ☐
2. $5\ in., 3\ in., 2\ in.$ ☐
3. $7\ in., 4\ in., 6\ in.$ ☐
4. $11\ cm., 15\ cm., 5\ cm.$ ☐
5. $7\ cm., 12\ cm., 17\ cm.$ ☐

***II. Which of the following measures could be the length of the third side $(x)$ of the triangle? Select $(/)$ if it could be the measure of the third side and $(X)$ if not.***

**Given: $12\ cm, 8\ cm, x$**

1. $3\ cm$ ☐
2. $4\ cm$ ☐
3. $6\ cm$ ☐
4. $7\ cm$ ☐
5. $10\ cm$ ☐