

PYTHAGORAS RULE

Subject

Mathematics

Prepared By

[Instructor Name]

Grade Level

5

Overview

This lesson plan covers teaching content for;

1. Definition of Pythagorean Theorem.
2. Solving equations using the Pythagorean Theorem.

Objectives

Students should be able to;

1. Define the Pythagorean Theorem.
2. Solve equations using the Pythagorean Theorem.

Activity Starter/Instruction

1. The Pythagorean Theorem lets you find the third side of a right triangle if you already know the two other sides.
2. Ask each student to draw a RIGHT triangle on paper. Students need to use a tool (such as a triangular ruler or a corner of some object) such as to make sure their triangles have a right angle. Ask them to measure all the sides in each triangle.
3. Take some of their measurements and show (without using the squaring symbol) that
4. $(\text{side 1}) \cdot (\text{side 1}) + (\text{side 2}) \cdot (\text{side 2}) = (\text{longest side}) \cdot (\text{longest side})$
5. $a^2 + b^2 = c^2$ is true for some of the triangles they drew.

Teacher Guide

Day 1/ Lesson 1: 20mins

1. Draw a right triangle on the board, and have students do the same. Label the right angle with the symbol. Then define and state the following, pointing out and labeling the triangle throughout the explanation. Students should take notes on their sheet.
2. The legs are the two sides of the triangle that form the right angle. We always use lower case letters **a** and **b** to represent the legs of a right triangle.
3. The hypotenuse is the side opposite (across from) the right angle. We always use lower case **c** to represent the hypotenuse of a right triangle.
4. In a right triangle, the legs are the shorter sides and the hypotenuse is always the longest side
5. In any right triangle, the following is always true:
 - The sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse.
 - This important relationship is known as the Pythagorean Theorem.
 - $a^2 + b^2 = c^2$
6. Teacher replace variable a and b to solve for c. For example a is 3 and b is 4.
7. $a^2 + b^2 = c^2$; $3^2 + 4^2 = c^2$; $9 + 16 = c^2$; $25 = c^2$; $c = \sqrt{25}$; $c = 5$.

Materials Required

- Shoe
- Ruler
- White board
- Marker
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Additional Resources

- <http://www.mrseteachesmath.com/2016/01/pythagorean-proof-without-words.html>
- <http://blog.mathpl.us/?p=216>
- <http://www.cpalms.org/Public/PreviewResourceLesson>
- <http://www.mrseteachesmath.com/2017/01/pythagorean-inb-pages.html>
- https://www.khanacademy.org/math/basic-geo/basic-pythagorean-theorem/geo-pythagorean-theorem/e/pythagorean_theorem_1
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Additional Notes

Guided Practice

Day 2/ Lesson 2: 15 Mins

1. Gather up as many shoes as you can.
2. Since Pythagoras' Theorem only works for 90 degree triangles, line your shoes up to form the letter L.
3. Label one line of shoes A, and the other line of shoes B (you could call them "legs" of a triangle!)
4. Measure each line of shoes with your measuring device and record them on your paper. $A =$; $B =$.
5. Now we have enough information to solve the distance from the tip of one line of shoes to the tip of the other line of shoes. We call this line the hypotenuse.
6. Using Pythagoras' Theorem $A^2 + B^2 = C^2$ solve for the distance of C, our hypotenuse.
7. $C = \sqrt{A^2 + B^2}$
8. Put in your recorded information for A and B and solve for C. Record your answer. C (by calculation) =.
9. After recording your data, use your measuring device to measure the hypotenuse (the distance from the tip of one line of shoes to the tip of the other line of shoes). Did you get the same answer? C (by measurement) =.

Guided Practice

Day 3/ Lesson 3: 20mins

1. Give students a grid paper with a happy face at any point of the grid and plain grid paper.
2. Starting at the happy face, students will draw a vertical line that extends up three squares.
3. Again starting at the happy face, draw a horizontal line that extends to the right a distance of 4 square.
4. They'll connect the ends of those lines that they have drawn. They should now have a right angle triangle.
5. Students should draw a square that touches the left side of the triangle and matches up against it perfectly.
6. They should do the same thing to the bottom of the triangle, and shade or color each square that they have drawn in a different manner.
7. Next, they use the plain grid as a "ruler" to find the length of the longest side of the triangle.
8. Once they have the length of the longest side, they should cut out a square with sides of that length.
9. Glue, or tape, that square up against the longest side of the triangle.
10. Determine the area of each square and write the area inside each square.

Summary	Assessment Activity	Assessment Activity
1. Teachers may check the students' work as well as answers to determine the extent to which the lesson's objectives have been achieved.	1. Throughout the lesson and activity, the teacher will be questioning, prompting, monitoring, and observing students as they work on various examples.	Assess if students can; 1. Solve problems using the Pythagoras theorem correctly.