

The Juice Seller's Problem

1) Teacher's Guide Ghada Sulaiman .A. Marmash

1) Teacher's Guide

My best greetings , I am Ghada Marmash , thank you for choosing this lesson , I hope you have enjoyed using and teaching this module in this lesson , as I have enjoyed preparing it .

The prerequisites of this lesson:

1. Pythagorean Theorem.
2. Calculation of triangle Area knowing the angle between its two sides.
3. Cosine rule.
4. Calculating circle's Area.
5. Calculations of areas and volumes of solids with regular bases.

In pause 1,
The students must pour sand from two containers into a third and write their notes, to draw conclusions.

In pause 2,
The students have to draw many polygons on the sides and hypotenuse of a right angle triangle, such as equilateral triangles, squares, pentagons and hexagons with regular sides. Please my dear colleagues help your students to find the areas of these polygons by using sine and cosine rules.

In pause 3,
The students have to draw equilateral pentagons on the sides and hypotenuse of right angle triangle and divide each of them into 5 triangles, they will be surprised that these triangles are not equilateral; here my dear colleagues please direct your students to use cosine rule to find the base area.

In pause 4,
Divide the class into groups and ask each group to find the volume of the solids they found its area before. Explain that by multiplying the base area of the object by its height they will get its volume. Then ask each group to prove that the volume of the regular prism which is instructed on the hypotenuse of a right angle triangle equals the sum of the volumes of the two regular prisms which are constructed on its sides (under the condition they all have the same height).
First group takes triangular prisms, second group takes squarely prisms, and third group takes pentagonal prisms, and so on, until the class come to a conclusion that the volumes of polygons on the sides of the right angle triangle are equal to the volume of the polygon on its hypotenuse which applies with Pythagorean Theorem.

In pause 5
The students try to help juice seller after they have learned that Pythagoras theorem is applicable on volumes of solids as on areas.
They use sticks to measure the diameter of cylinder, which has the equivalent volume for the two cylinders.

**They also use sticks to help the builder, and the housewife by using Pythagoras
theorem on right angle triangle.
I hope you have enjoyed this lesson, thank you for your attention and
cooperating.
Good bye.**

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Modules title: Pythagoras and juice seller (4

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6) The time to complete the lesson one hour.

7) Materials needed for the lesson.

1) Right angle triangle constructed on its sides and hypotenuse equilateral triangles,
equilateral polygons, circles, regular hexagon regular pentagon,

2) Cylinders, prisms, pentagonal prisms, cubes, sand

8) Some activities:

1) Play Pythagoras theorem game.

2) Let students pour sand from two containers into third one and write their notes to
come up with a conclusion.

9) Online references:

<http://www.frontiernet.net/~imaging/pythagorean.html>

<http://www.cut-the-knot.org/pythagoras/index.shtml>