University of
BRISTOL

Greek geometry 1

(by Ksenia Shalonova)

Practical lessons from ancient geometers. We are going to learn of the contribution from two ancient Greeks, Pythagoras and Thales. Both visited Egypt to gain understanding.

> ### Right-angled triangles
>
> Pythagoras' theorem connects the side lenghts of right-angled trianges. Can you come up with some right-angled triangles with whole numbers for side lengths? This may give you a clue how they made right angles in Ancient Egypt using only a rope.

Suppose you want to make a badminton court in your garden.

- How will you make right angles using a rope? How many people would you ideally need to construct it?

- How many poles would you need to draw a long straight line (you can stick poles in the ground)?

- How will you check in the end that your quadrilateral is a rectangle?

University of
BRISTOL

Greek Geometry 2

(by Ksenia Shalonova)

Measuring the distance to a ship. Thales used geometry for measuring distances. He measured distances to the ships in navigation, distances to the stars and even worked out the height of the pyramid in Egypt.

> ### Similar triangles
>
> In Ancient Greece they used the properties of the similar triangles to measure distances. In similar triangles, the angles are the same and corresponding sides are proportional. Can you sketch two similar triangles? Can similar triangles be right-angled?

You are standing on the shore and want to calculate distance to the ship. For measuring the distance you are only allowed to use a pole, but you are free to move on the shore.

you start here
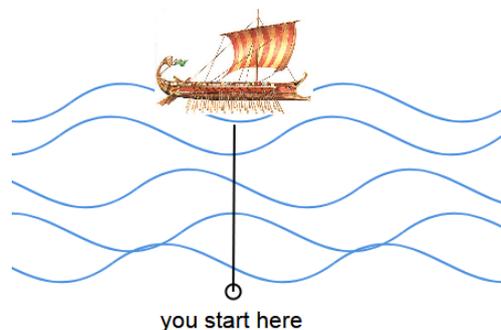
Greek Geometry 3

(by Ksenia Shalonova)

Measuring heights There are a number of methods for measuring heights,

for example, you can use the length of the shadow (on a sunny day). You can also use a mirror or a hand-drawn triangle.

In Jules Verne's "The Mysterious Island" Captain Harding wanted to find the height of a cliff and for this he used a tall poll. There is only one disadvantage of using this method - you have to lie down on the ground! Can you figure out how he did it by using properties of similar triangles and the line of sight?

Greek Geometry 4

(by Ksenia Shalonova)

Measuring river width with a straw

> ### Thales' Theorems
>
> There are several theorems that are attributed to Thales. For example, the circle is bisected by its diameter or the angle in a semi-circle is right angle. Knowledge of the angles in a circle can help you to solve the next problem.

You are standing on a river shore and want to measure an approximate width of a river. You can use a straw (or a small stick). Try to solve the problem first without looking at the hint!

You with a straw
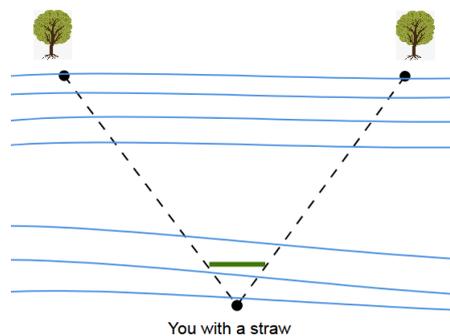
Hint. Notice any two objects on the opposite side of the river (e.g., flowers or trees). Hold a stick horizontally with an outstreched hand where the first object is directly behind the left end of the straw and another object is directly behind the right end of the straw. Reduce the size of the straw - you have to decide by how much. Start moving back until the position of one object is directly behind the left end of the straw and ...