

Questions from “Numbers in the Sand”

1. When and where was Pythagoras born?
2. What did Pythagoras believe could describe everything in the world?
3. What are whole numbers? What are fractions? Give three examples of each.
4. What is the Pythagoras’ great theorem on right triangles?
5. What “number” did Philocleas and Dionysios discover using Pythagoras’ theorem? How did they discover it?
6. Find the square root of 2 on a calculator and convert to a decimal number. What is the result? Does the result “appear” to terminate, repeat, or neither?
7. According to the story, what is “special” about the square root of 2? What are these types of numbers called today? What are some examples of other numbers like square root of 2?
8. Why do you think numbers that cannot be represented as a fraction are called irrational?

Teacher's Copy of Questions with suggested answers

1. When and where was Pythagoras born? (On the Greek Island of Samos around 572 BC)
2. What did Pythagoras believe could describe everything in the world? (whole numbers or fractions)
3. What are whole numbers? (The counting numbers we all first learn as small children 1,2,3,4,ect.) What are fractions? (A ratio of two whole numbers such as $\frac{1}{2}$ or $\frac{3}{4}$) Give three examples of each.
4. What is the Pythagoras' great theorem on right triangles? (The Pythagorean Theorem. Students may need to use a reference book)
5. What "number" did Philocleas and Dionea discover using Pythagoras' theorem? How did they discover it? (The square root of 2; They explored a right triangle with the lengths of the two sides both equal to one unit in length.)
6. Find the square root of 2 on a calculator and convert to a decimal number. What is the result? Does the result "appear" to terminate, repeat, or neither? (1.414213...; it neither terminates or repeats.)
7. According to the story, what is "special" about the square root of 2? (It cannot be represented as a fraction or ratio of whole numbers) What do we call these types of numbers today? (Irrational) What are some examples of other numbers like square root of 2? (square root of 3,5,6, etc., π , or any non-terminating or non-repeating decimal number such as 0.1010010001 or 112123123412345...)
8. Why do you think that numbers that cannot be represented as a fraction are called irrational numbers? (They are beyond REASON!)