

# Rational numbers and similarity

*In this activity we play a game of “what if” and see a reason that the ancient Greeks might have wanted every number to be rational.*

**Exploration 1** *Think about plain old plane geometry. What are some theorems that you would want to be true?*

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**Question 2** *What are the basic theorems involving similar triangles?*

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OK—now we are going to do something very strange. Let’s suppose that every number is rational. In essence, let’s put ourselves into the mindset of the ancient Greeks, **before** they knew that irrational numbers existed.

**Exploration 3** *Suppose that you have two triangles whose angles are congruent. Can you make a fairly simple argument, using the fact that the sides are rational numbers, that shows that the sides are proportional? Hint: You may need to use ASA.*

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**Exploration 4** *Suppose that you have two triangles whose sides are proportional. Can you make a fairly simple argument, using the fact that the sides are rational numbers, that shows that the angles are congruent? Hint: You may need to use SSS.*

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