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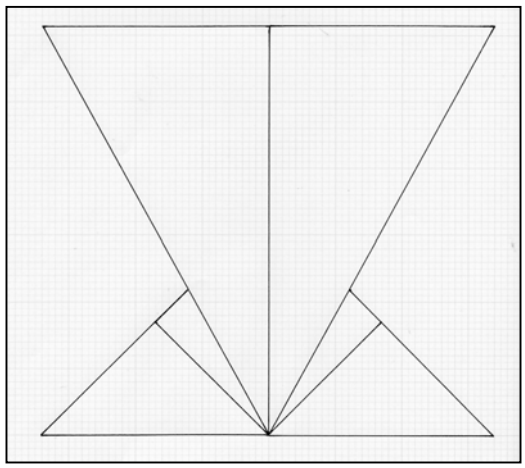
Fractal Triangles

Complements to Basic and Special Right Triangles



Charles William Johnson

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Fractal Triangles

Complements to Basic and Special Right Triangles:

Excerpts from the Book...

Charles William Johnson

Fractal Triangles examines the nature of the right triangle. Generally, high-school and university textbooks of geometry teach about the *basic* and *special* right triangles. The two main basic triangles are the $3 \cdot 4 \cdot 5$ and the $5 \cdot 12 \cdot 13$ triangle. The two main special triangles are the $1 \cdot 1 \cdot \sqrt{2}$ and the $1 \cdot \sqrt{3} \cdot 2$ triangle. These latter two triangles correspond in order to the $45^\circ \cdot 45^\circ \cdot 90^\circ$ and the $30^\circ \cdot 60^\circ \cdot 90^\circ$ triangles.

Fractal Triangles presents different series of triangles that are complementary to the basic and special triangles in forming a circle. The *fractal* triangles consist of terms whereby one of the terms is a whole number of a square root number. The square root numbers may be almost any prime or non-prime number. However, certain series of fractal triangles are emphasized in this study. For example:

$$\mathbf{1 \cdot 4\sqrt{3} \cdot 7} \qquad \mathbf{1 \cdot 7 \cdot 5\sqrt{2}}$$

This study shows how a right angle (90 degrees) may consist of basic, special, and fractal triangles combined. It is this complementareity of right triangles that reveals the significance of the fractal triangles.

Fractal Triangles discusses the possible relationship of the right triangle in general to the physical and chemical constants, as well as other relationships of spacetime/motion (matter-energy). The underlying subject, then, concerns the union of geometry with chemistry and physics.

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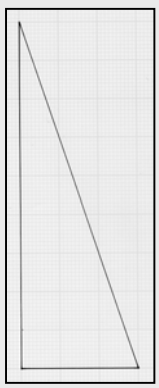
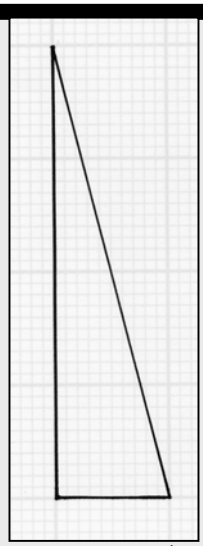
Now, let us look at the different aspects of a right triangle, its side measurements, its angles and its algebraic notation.

Side Measurements	*Symbolic Notation*	*Angles*
1 · 1 · 1.4142	1 · 1 · √2	**45º · 45º · 90º**
1 · 2 · 2.236	1 · 2 · √5	26.5651º · 63.4349º · 90º
1 · 1.732 · 2	1 · √3 · 2	**30º · 60º · 90º**
3 · 4 · 5	3 · 4 · 5	36.8699º · 53.1301º · 90º
5 · 12 · 13	5 · 12 · 13	22.6199º · 67.3801º · 90º

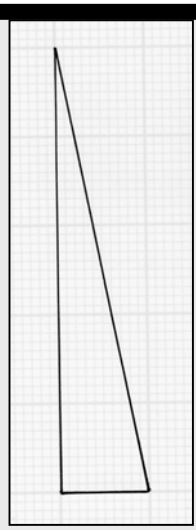
Although traditionally it has been rather convenient to treat only those triangles with whole numbers in either their terms or their angles, one must comprehend the *entire* series of right triangles. The next best method for managing triangles lacking whole numbers in their terms or angles, is to treat those triangles that contain a square root expression in their make-up. Note the basic triangles that follow:



1 ·3·√10



1 · 4 · √17



1 · 5 · √ 26

1 · 8 · √65

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Observations

The right triangles presented in this study represent divisions in spacetime. The projected ***nano-right triangles***, which become incommensurable (on my pocket calculator) suggest an unsuspecting significance to me. Recently, I read about the newly discovered importance of nano-right triangles in the transportation and delivery of medicine within the human body. Consider the possibility that these projected fractal triangles might serve thereof.

Outside of that surprising possibility, it is important to simply identify series of **fractal right triangles** whose relationship of their side measurements may be expressed as of **multiples of the square root of 2, 3, and beyond**, in the manner as identified in this study.

In traditional geometry, the existence of measurements expressed in fractions or irrational numbers is often presented as though Nature herself were incomprehensibly irrational. By identifying the complementariety of fractal triangles to basic and special right triangles, a more complete view of the right triangle obtains, and with that, it may be easier to understand how matter-energy exists.

From that perspective, the need arises to continue exploring possible relationships among the **basic**, **special** and **fractal** triangles in terms of spacetime/movement, and the specific forms of matter-energy in terms of physical and chemical constants.

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