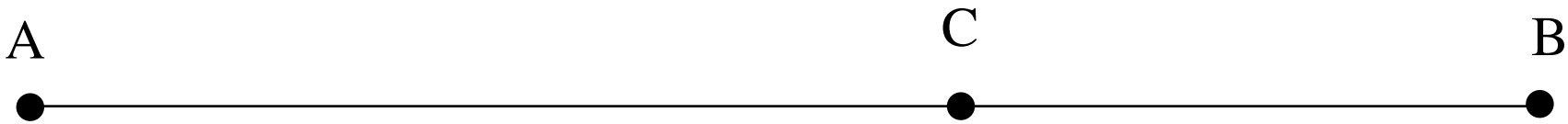
The Golden Ratio

Given a line segment AB, the point C on the line such that the ratio of the length of the line AB to the length AC is the same as the ratio of the length of line segment AC to the length CB.

This ratio is known as the golden ratio and is denoted by the greek letter ϕ. $\frac{AB}{AC} = \frac{AC}{CB} = \phi$

The Golden Ratio: $\frac{AB}{AC} = \frac{AC}{CB} = \phi$



Golden Ratio: Solutions to quadratic equations

An equation of the form:

$$ax^2 + bx + c = 0$$

has solutions

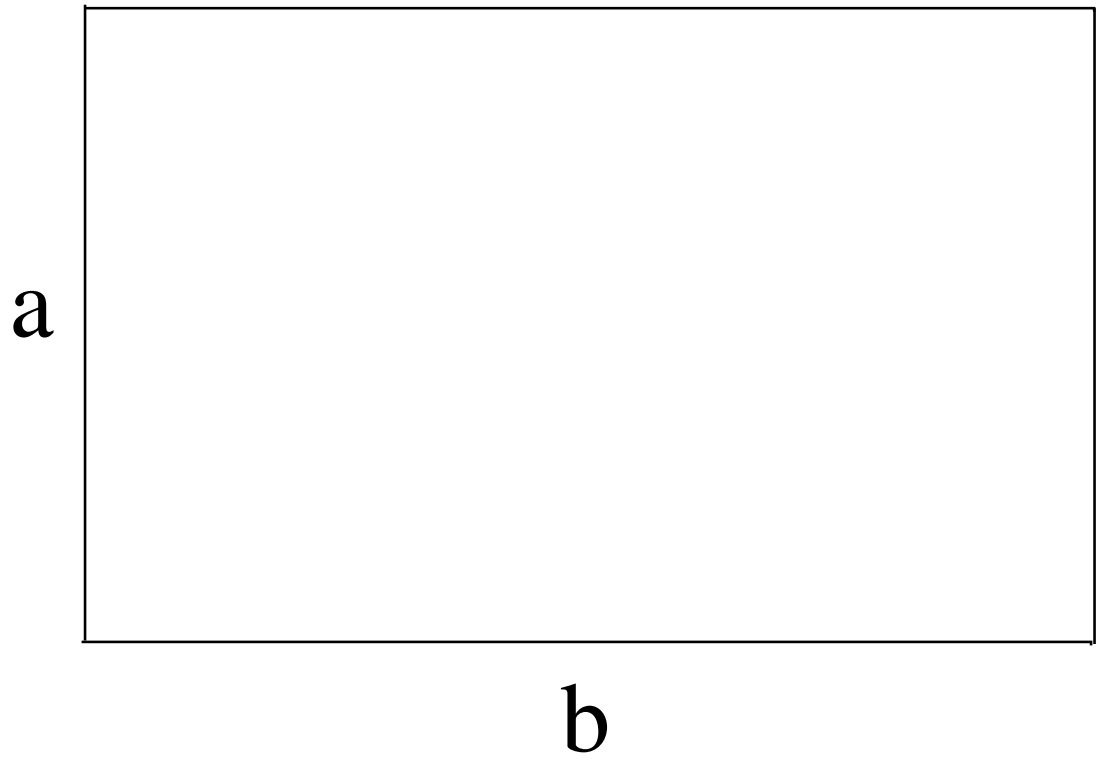
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

The value of the Golden Ratio

Construction 1: The Golden Cut

Golden Rectangle

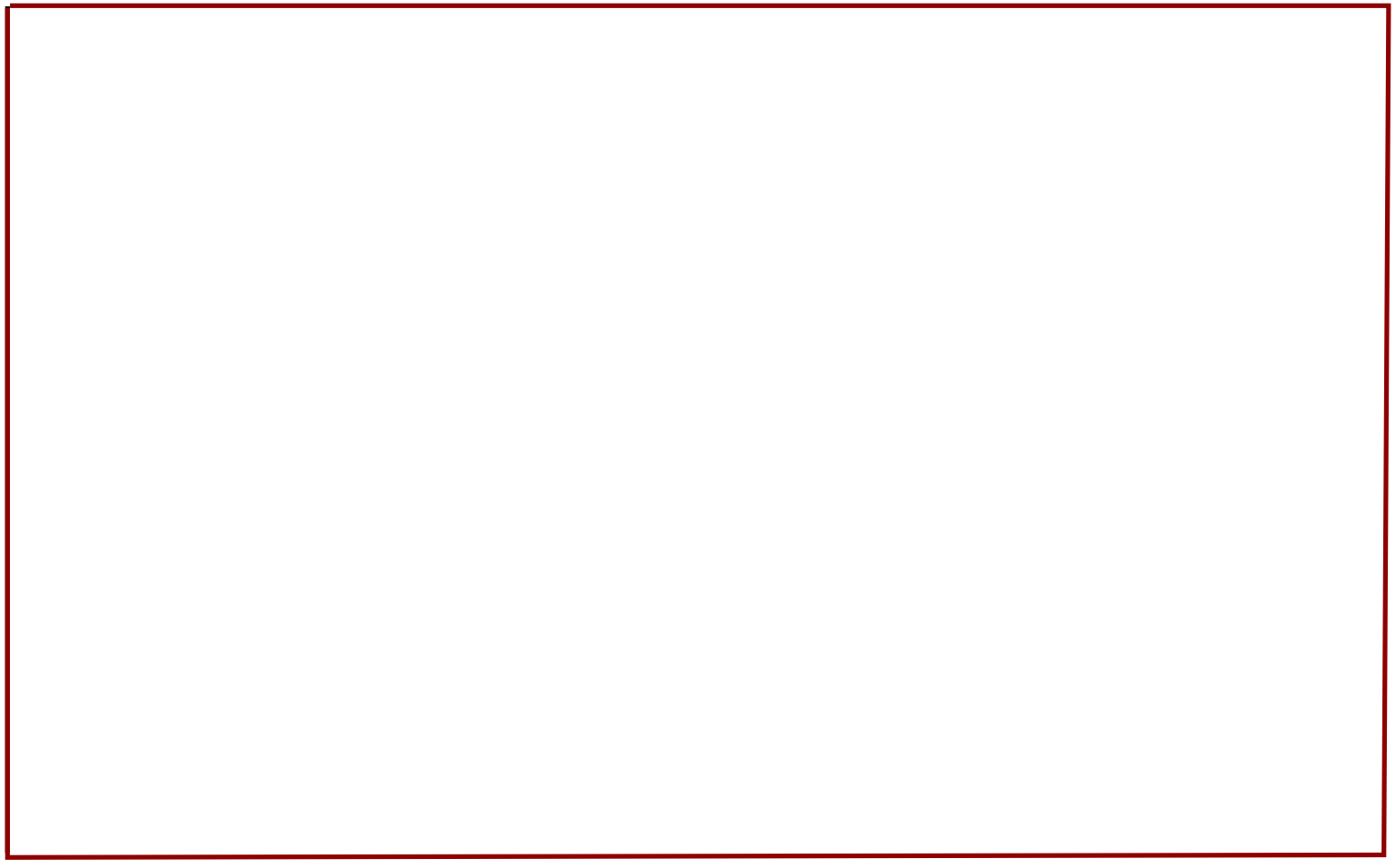
A Golden rectangle is a rectangle that has side lengths that are in golden proportion.



$$\frac{b}{a} = \phi$$

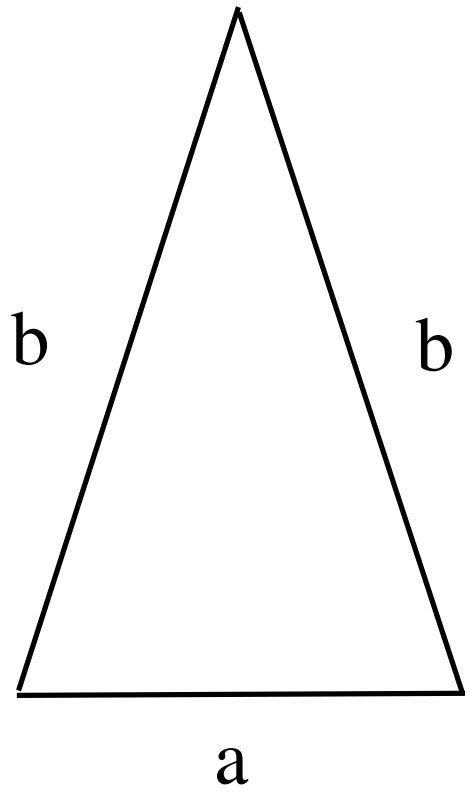
Construction 2: Golden Rectangle given shorter side

Construction 3: Golden Spriral

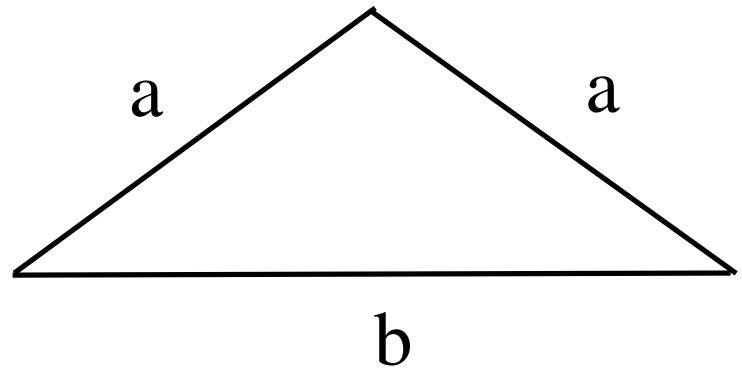


Golden Triangles

Golden Acute Triangle

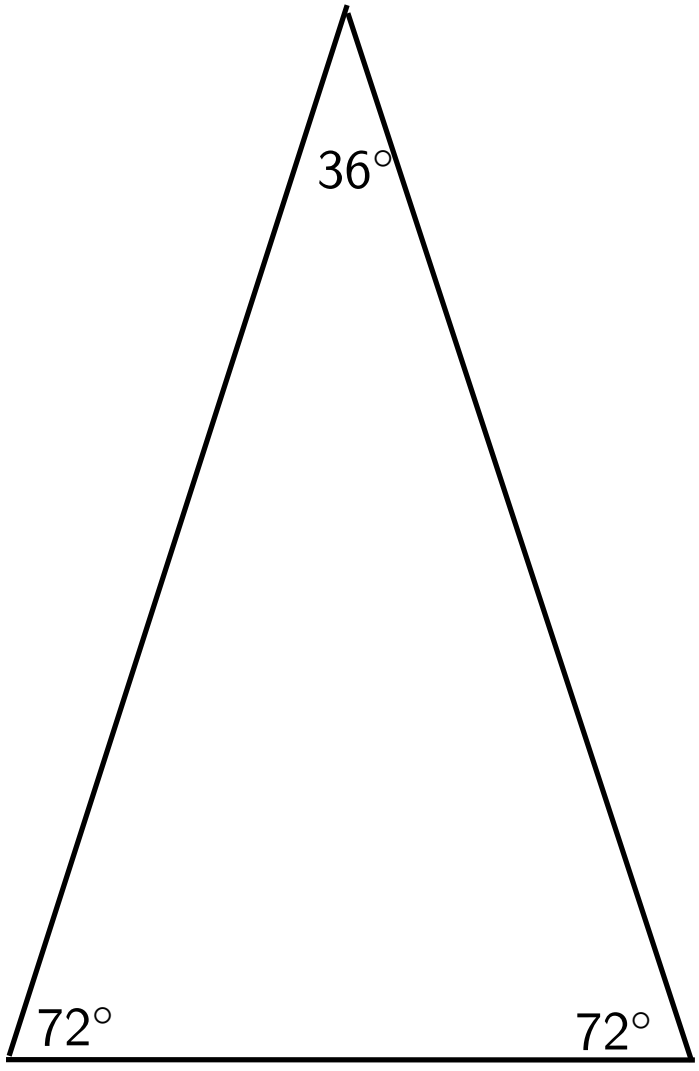


Golden Obtuse Triangle



$$\frac{b}{a} = \phi$$

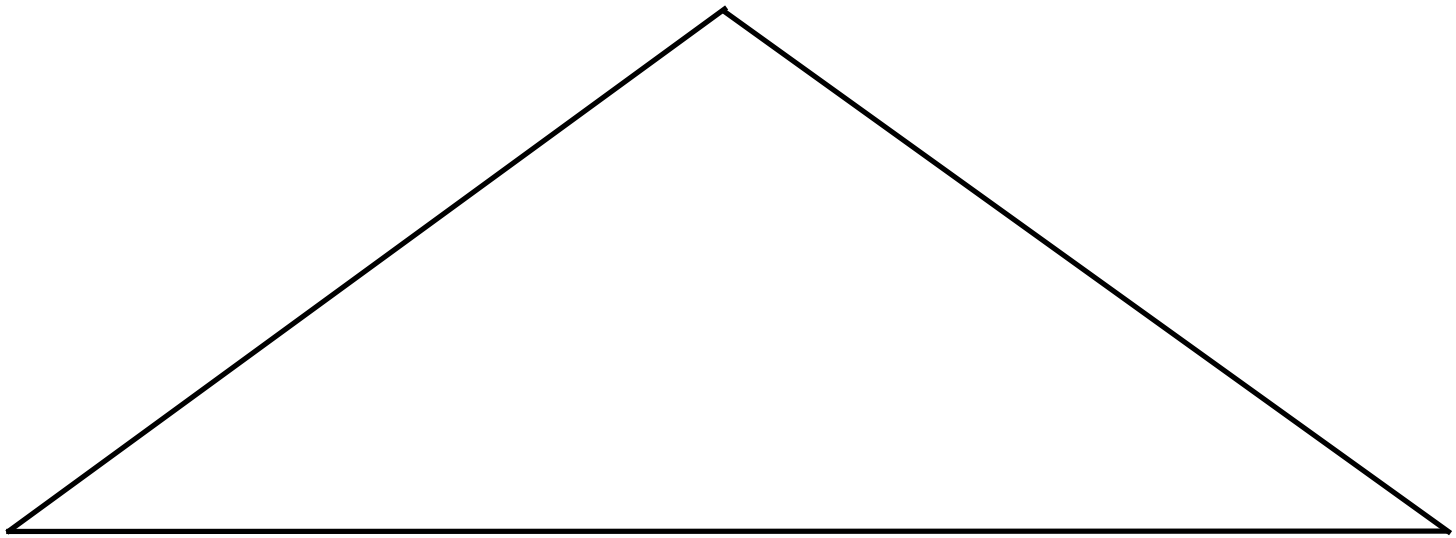
Is this a Golden Acute Triangle?



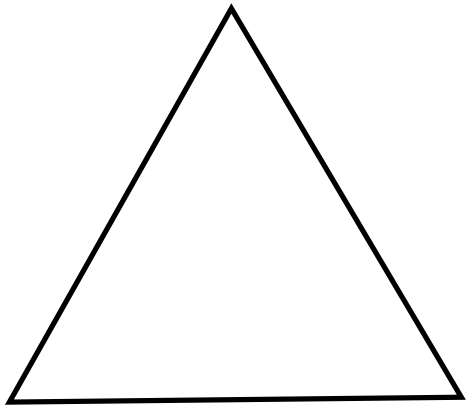
Construction 4: Acute Golden Triangle over a given base

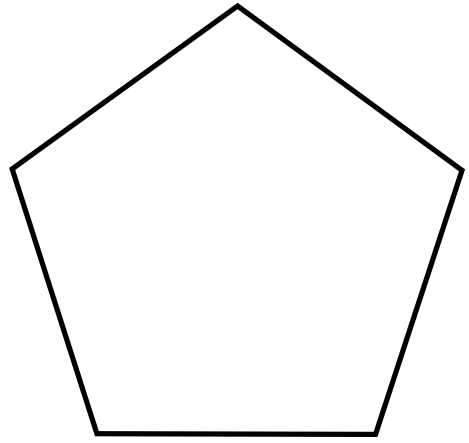
Construction 5: Acute Golden Triangle over a given base alternate construction

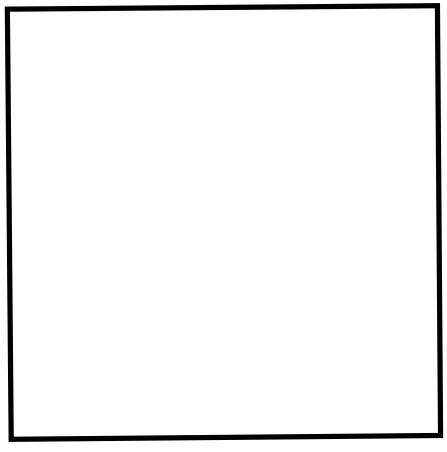
Construction 6: Subdividing an Obtuse Golden Triangle

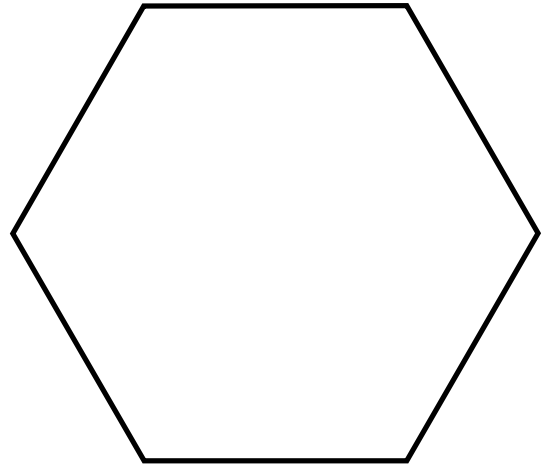


Regular Polygons









Construction 7: Regular Pentagon over a given side