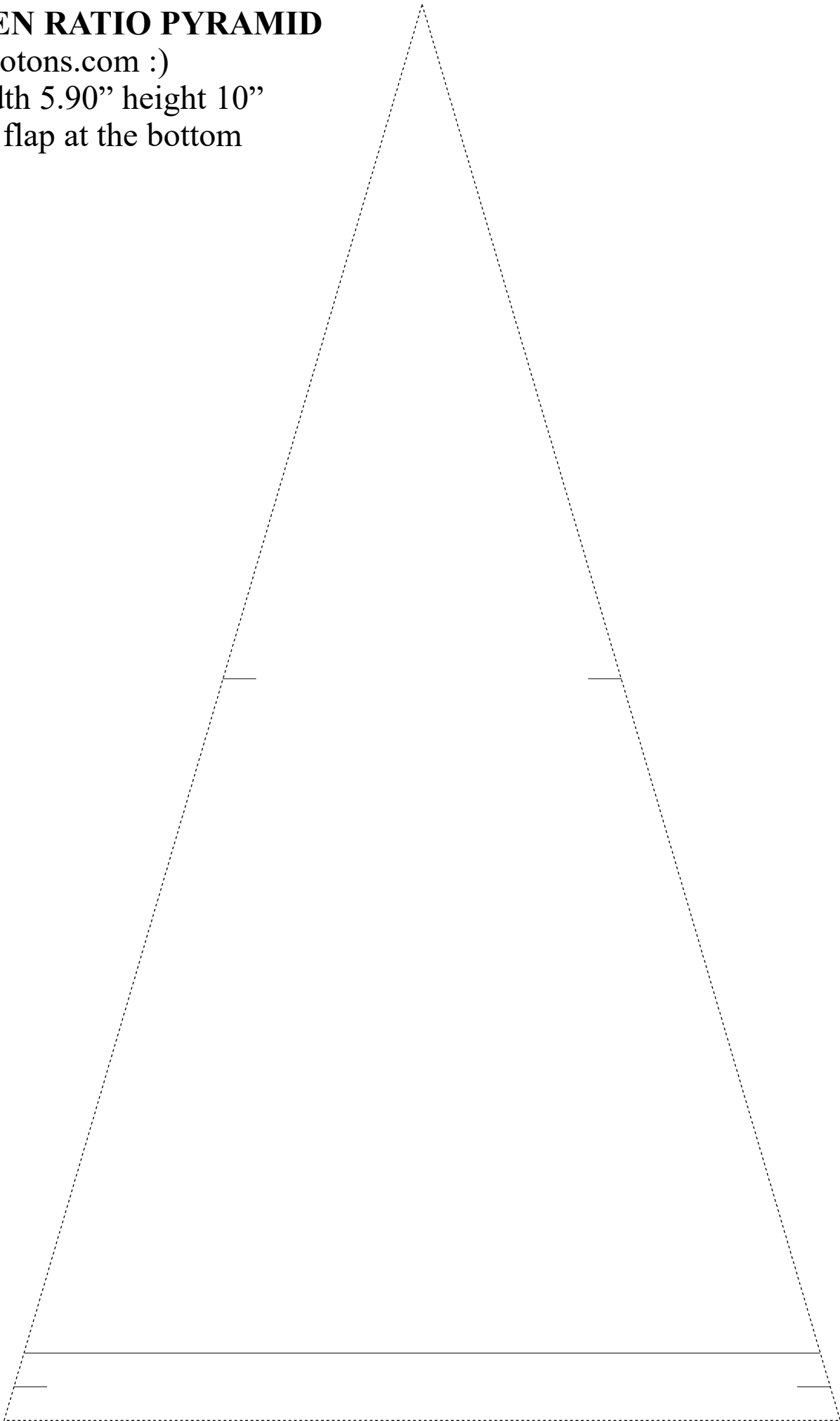


GOLDEN RATIO PYRAMID

felipephotons.com :)

face width 5.90" height 10"

plus .5" flap at the bottom

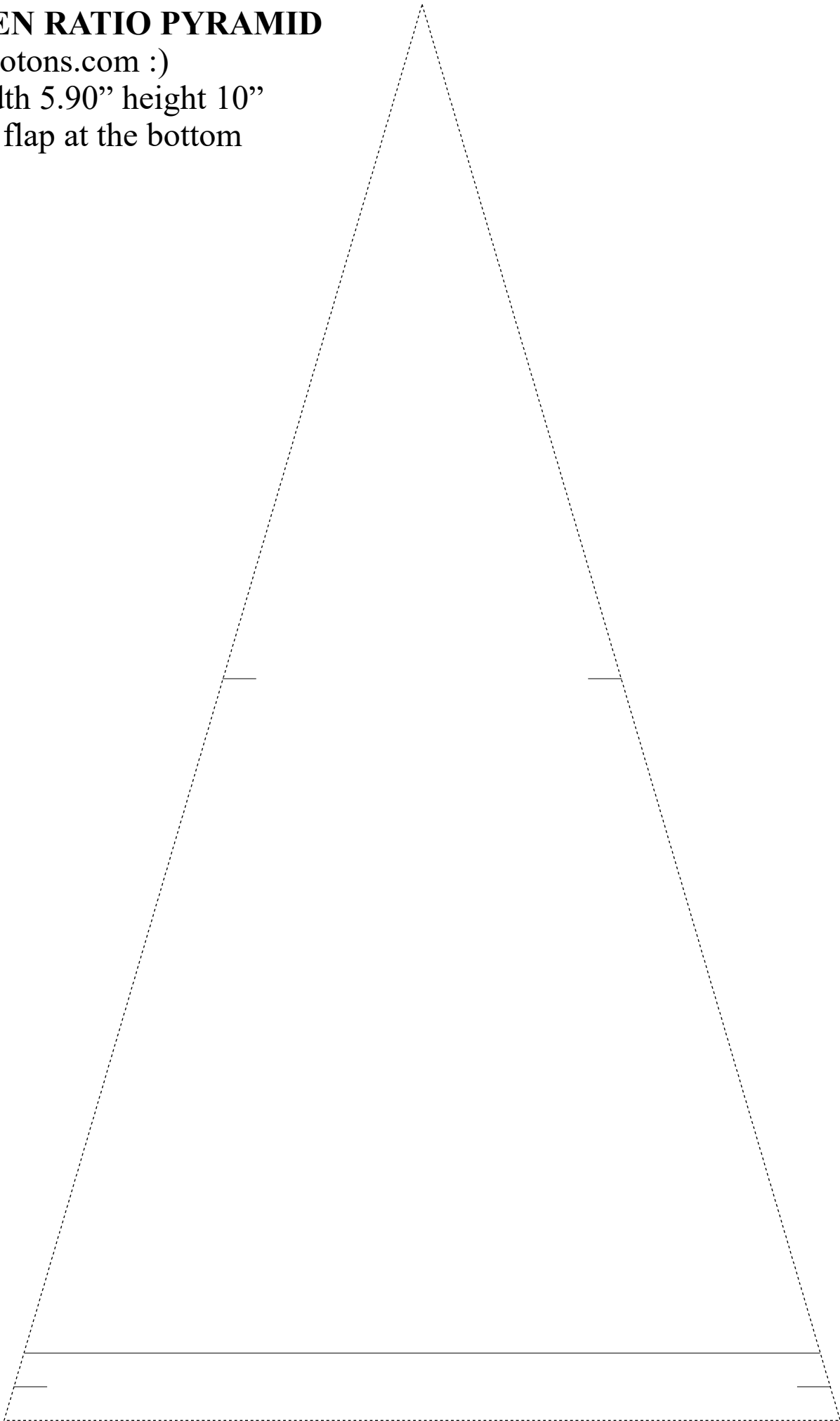


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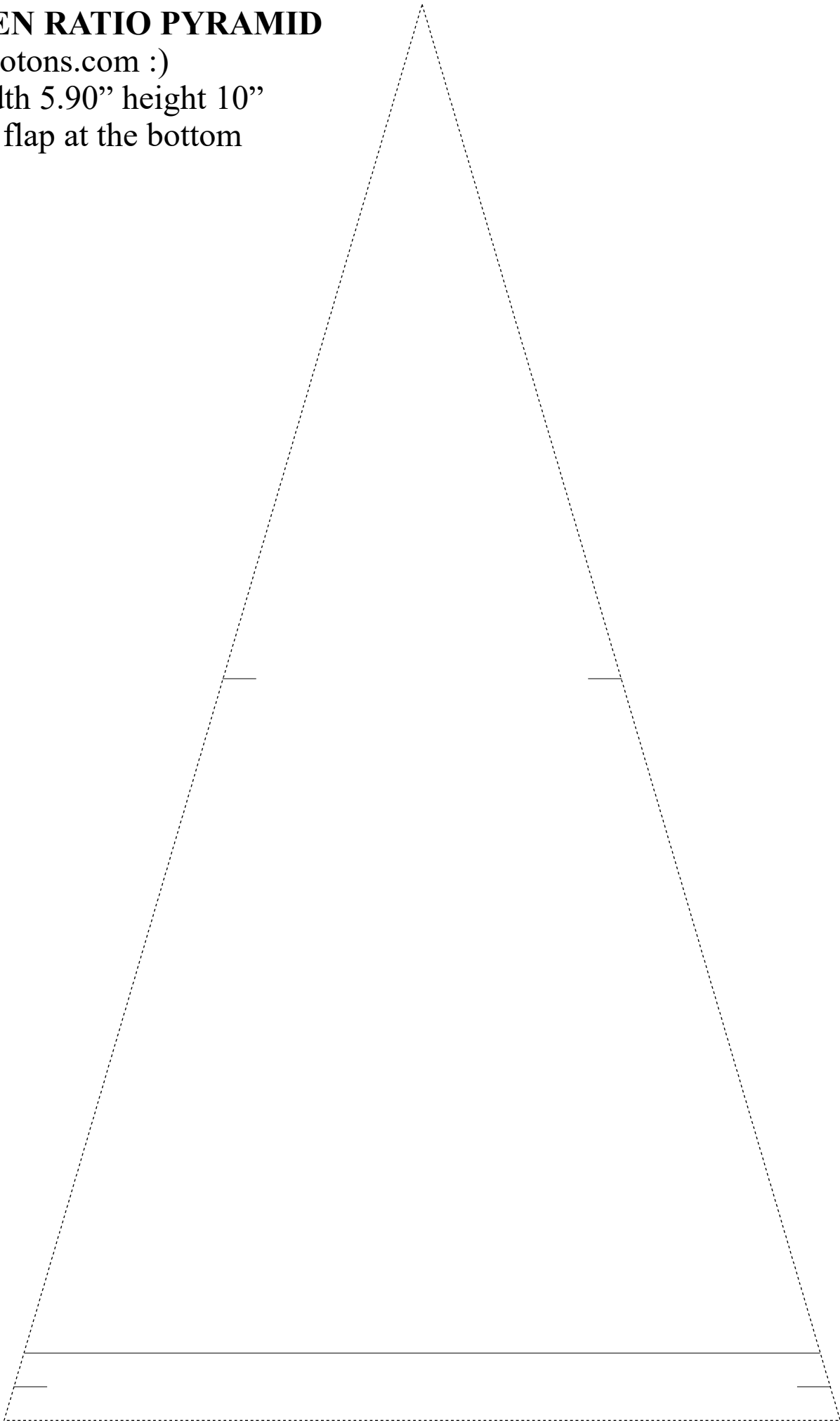


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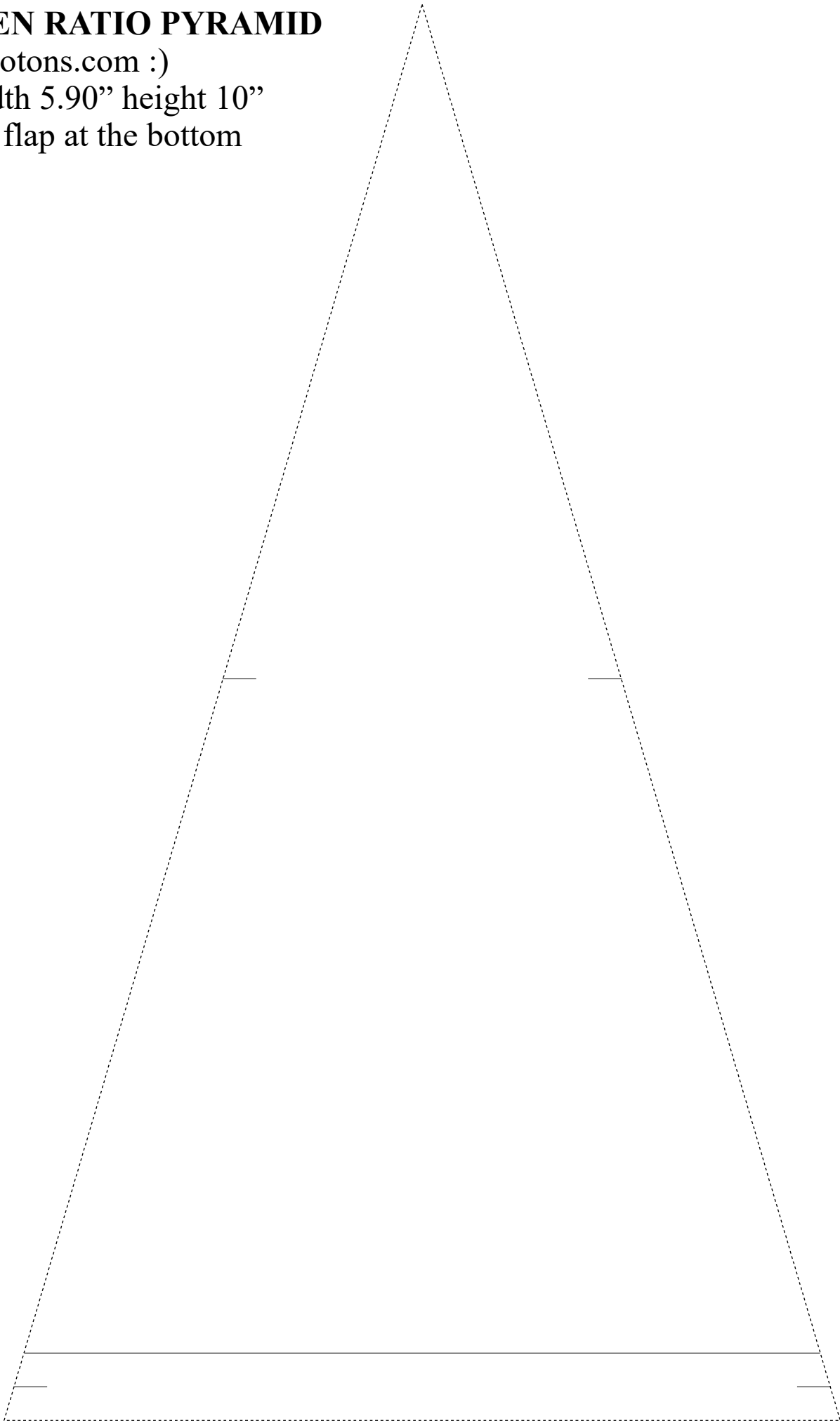


GOLDEN RATIO PYRAMID

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face width 5.90" height 10"

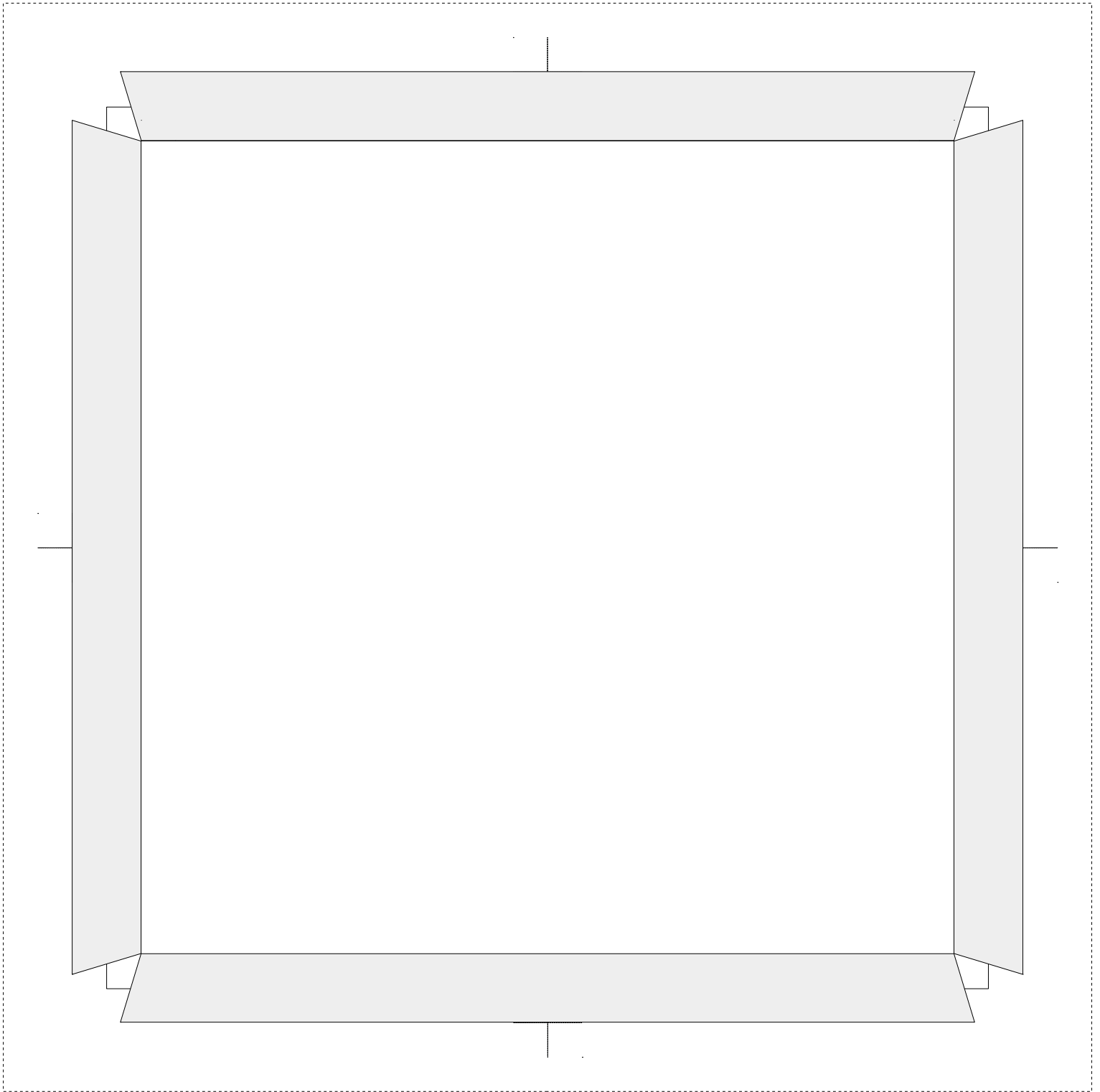
plus .5" flap at the bottom



GOLDEN RATIO PYRAMID

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inner square 5.90"x5.90" outer square 7.90"x7.90"



Assembly Instructions

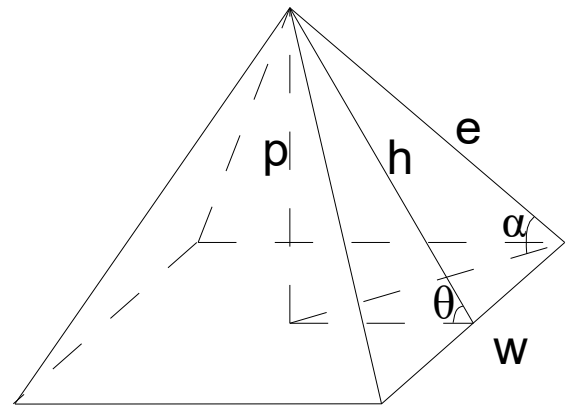
Cut all shapes along dashed lines only. Fold and unfold the bottom flap of each pyramid face (the long solid line) to create a crease. Use long pieces of tape to tape the long sides of the pyramid faces together. Use tick marks to align pieces. Make sure the tape ends up on the outside of the pyramid (this guarantees the last edge will be taped completely and there are no “cracks” for the energy to leak out). Tape each of the pyramid flaps to the corresponding shaded areas on the base.

GOLDEN RATIO PYRAMID

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VARIABLES & GENERAL FORMULAS

p = height of the pyramid
 w = length of the base of the pyramid
 h = height of the face of the pyramid
 e = long edge
 θ = pyramid face slope angle
 α = long edge slope angle



You can derive all of the formulas below by starting with these general formulas:

$$\begin{aligned} \tan \theta &= p/(w/2) & \sin \theta &= p/h & \cos \theta &= (w/2)/h \\ \tan \alpha &= p/((w/2)*\sqrt{2}) & \sin \alpha &= p/e & \cos \alpha &= ((w/2)*\sqrt{2})/e \end{aligned}$$

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$w = 1$ and $p = \phi = (1+\sqrt{5})/2$. See https://en.wikipedia.org/wiki/Golden_ratio for golden ratio derivation.

FINDING THE SLOPE ANGLE

$$\begin{aligned} \tan \theta &= p/(w/2) = \phi/(1/2) \\ \theta &= \text{atan}(\phi/(1/2)) = \text{atan}(((1+\sqrt{5})/2) / (1/2)) = \text{atan}(1+\sqrt{5}) \approx 72.827962^\circ \end{aligned}$$

FORMULAS

$h = p/\sin(\text{atan}(1+\sqrt{5}))$	$\approx p*1.046657$
$p = h*\sin(\text{atan}(1+\sqrt{5}))$	$\approx h*0.955423$
$h = w/(2*\cos(\text{atan}(1+\sqrt{5})))$	$\approx w*1.693527$
$w = h*2*\cos(\text{atan}(1+\sqrt{5}))$	$\approx h*0.590484$
$w = p*2/(1+\sqrt{5})$	$\approx p*0.618034$
$p = w/(2/(1+\sqrt{5}))$	$\approx w*1.618034$
$h = e*\sin(\text{atan}(1/(\cos(\text{atan}(1+\sqrt{5}))))))$	$\approx e*0.959073$
$e = h/\sin(\text{atan}(1/(\cos(\text{atan}(1+\sqrt{5}))))))$	$\approx h*1.042673$
$p = e*\sin(\text{atan}((1+\sqrt{5})/\sqrt{2}))$	$\approx e*0.916320$
$e = p/\sin(\text{atan}((1+\sqrt{5})/\sqrt{2}))$	$\approx p*1.091322$
$w = e*2*\cos(\text{atan}((1+\sqrt{5})/\sqrt{2}))/\sqrt{2}$	$\approx e*0.566317$
$e = w/(2*\cos(\text{atan}((1+\sqrt{5})/\sqrt{2}))/\sqrt{2})$	$\approx w*1.765796$

These shapes are accurate to two decimal points. Do not “auto-resize” when printing. Email me your comments and suggestions at felipephotons@gmail.com. :) If you LOVED this info and would like to make a contribution, I welcome your Love offerings over here!: paypal.me/felipephotons, [cash.me/\\$FelipePhotons](https://cash.me/$FelipePhotons) :)

God speed! = {D

Last updated March 26, 2018