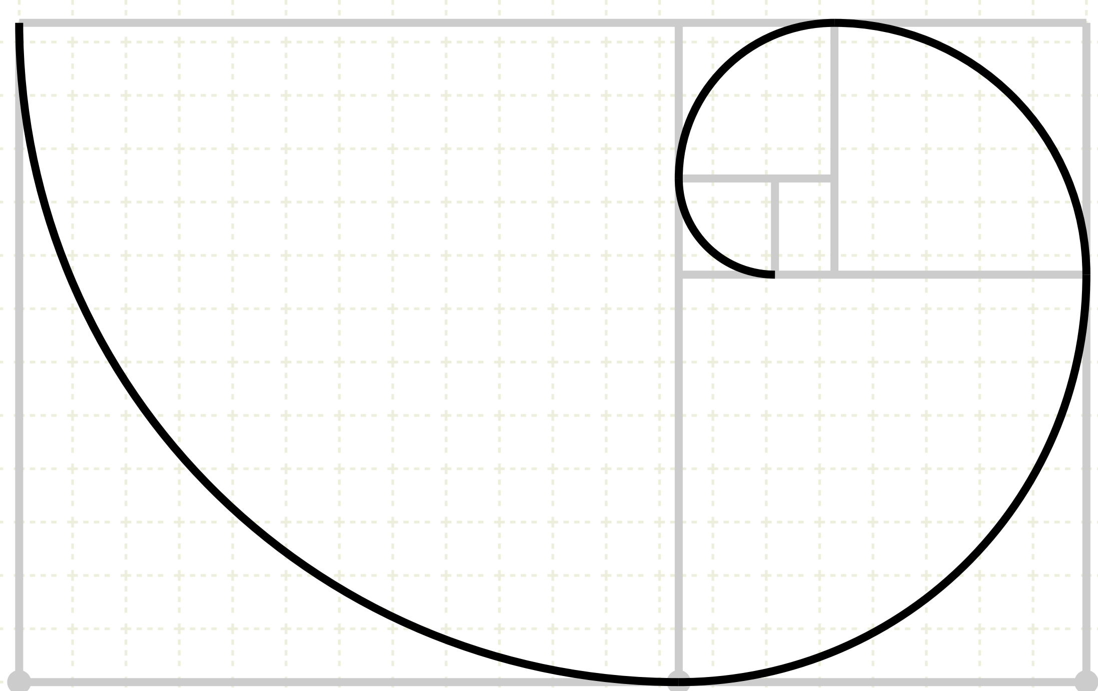
Euclid's Elements

Book VI



One can state, without exaggeration, that the observation of and the search for similarities and differences are the basis of all human knowledge.

Alfred Nobel

Table of Contents, Chapter 6

Table of Contents, Chapter 3

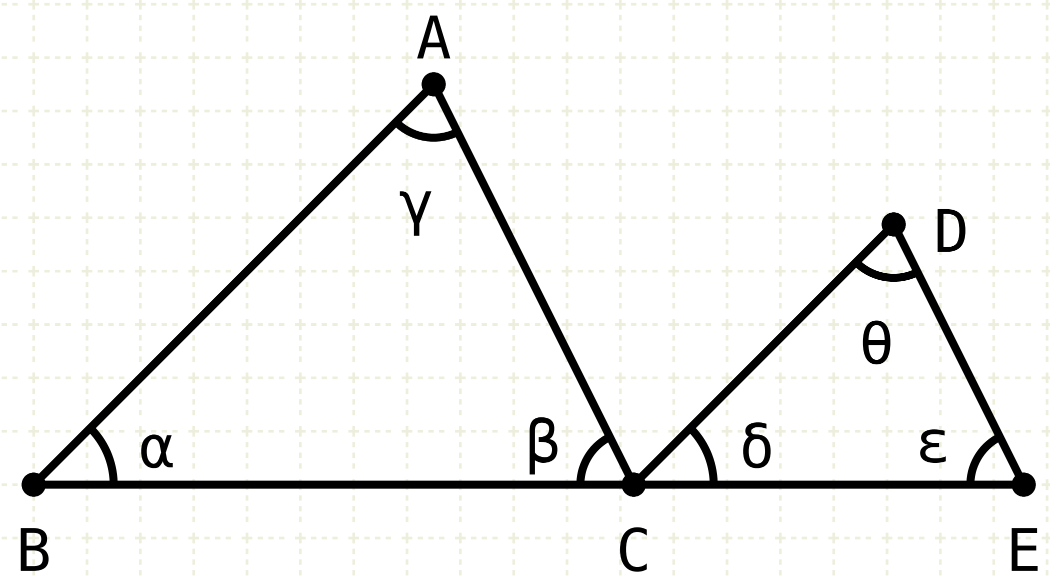
Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.

$\alpha = \delta, \ \beta = \varepsilon, \ \gamma = \theta$



In other words

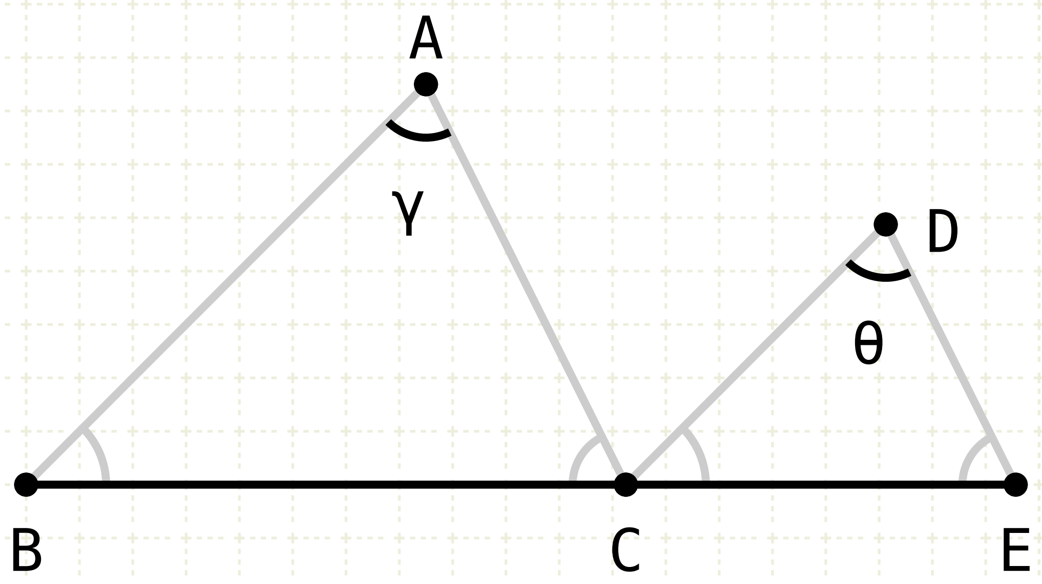
Given two equiangular triangles ABC and CDE, where the angle α equals angle δ, γ equals θ, and finally β equals ε, then…

The ratio of the sides (BC, CE) subtending the angles γ and θ is proportional to the ratio of the sides (AC, DE) subtending the angles α and δ, etc.

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.

$\alpha = \delta, \ \beta = \varepsilon, \ \gamma = \theta$



BC:CE

In other words

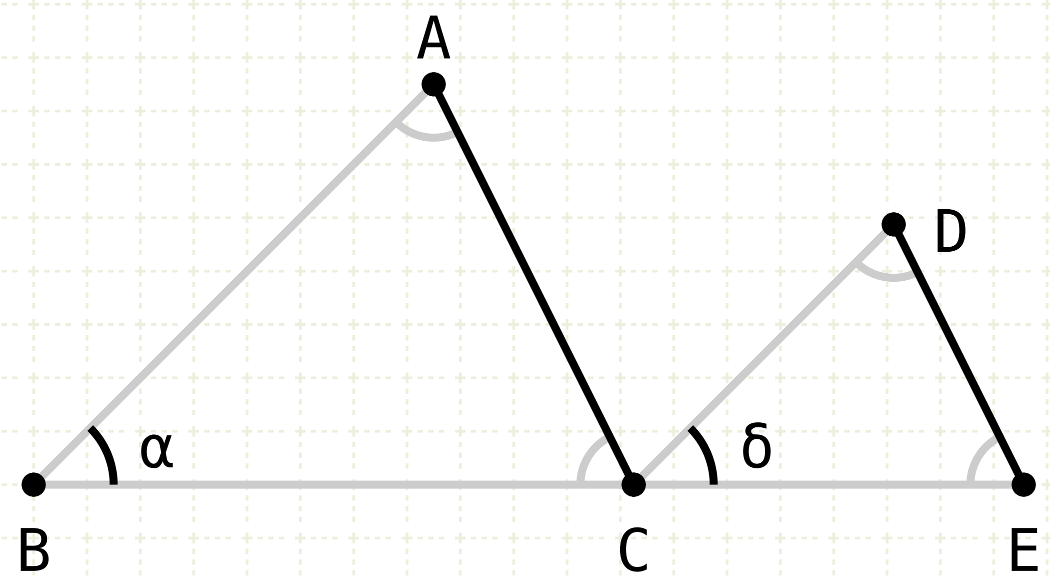
Given two equiangular triangles ABC and CDE, where the angle α equals angle δ, γ equals θ, and finally β equals ε, then…

The ratio of the sides (BC, CE) subtending the angles γ and θ is proportional to the ratio of the sides (AC, DE) subtending the angles α and δ, etc.

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.

$\alpha = \delta,\ \beta = \varepsilon,\ \gamma = \theta$



BC:CE = AC:DE

In other words

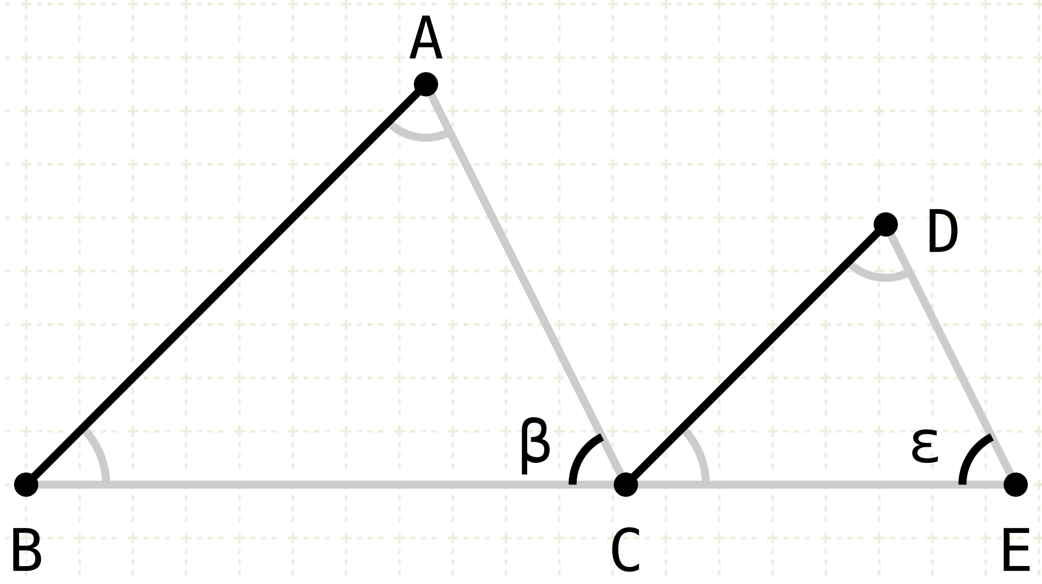
Given two equiangular triangles ABC and CDE, where the angle α equals angle δ, γ equals θ, and finally β equals ε, then…

The ratio of the sides (BC, CE) subtending the angles γ and θ is proportional to the ratio of the sides (AC, DE) subtending the angles α and δ, etc.

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.

$\alpha = \delta, \ \beta = \varepsilon, \ \gamma = \theta$



BC:CE = AC:DE = AB:CD

In other words

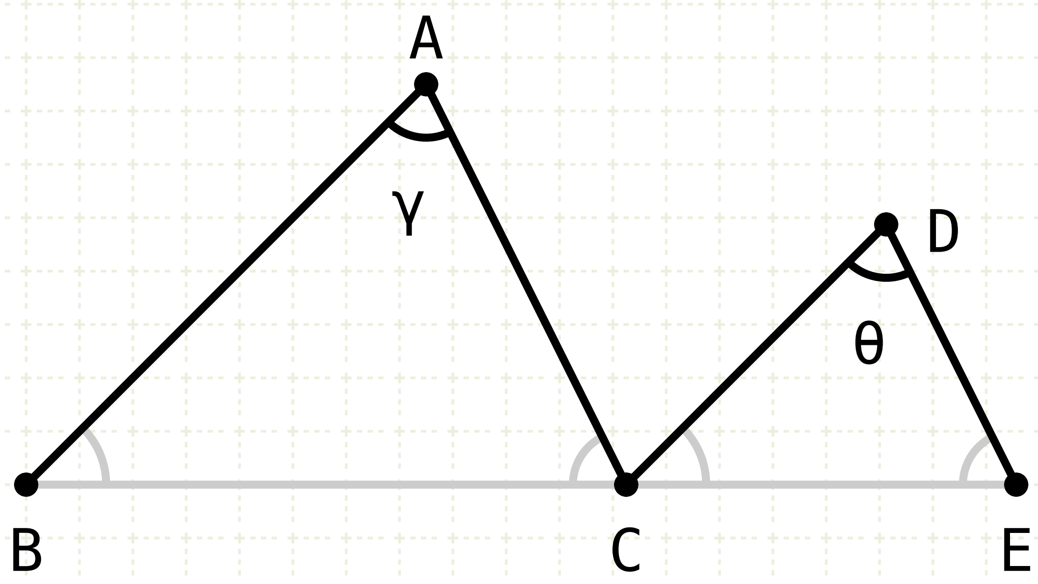
Given two equiangular triangles ABC and CDE, where the angle α equals angle δ, γ equals θ, and finally β equals ε, then…

The ratio of the sides (BC, CE) subtending the angles γ and θ is proportional to the ratio of the sides (AC, DE) subtending the angles α and δ, etc.

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.

$\alpha = \delta,\ \beta = \varepsilon,\ \gamma = \theta$



BC:CE = AC:DE = AB:CD

AB:AC = CD:DE

In other words

Given two equiangular triangles ABC and CDE, where the angle α equals angle δ, γ equals θ, and finally β equals ε, then…

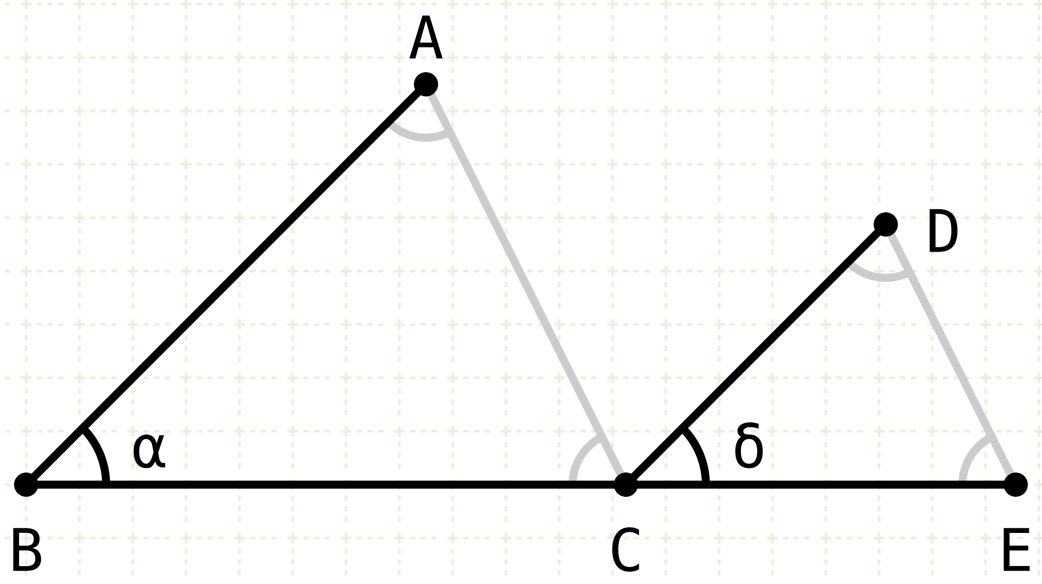
The ratio of the sides (BC, CE) subtending the angles γ and θ is proportional to the ratio of the sides (AC, DE) subtending the angles α and δ, etc.

Also, the ratio of the lines on either side of an angle in one triangle will be equal to the ratio of the lines in the other triangle which are on either side of the equal angle. AB to BC equals DE to CE, AC to BC equals DE to CE and AC to BC equals DE to CE

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.

$\alpha = \delta, \ \beta = \varepsilon, \ \gamma = \theta$



BC:CE = AC:DE = AB:CD

AB:AC = CD:DE

BC:AB = CE:CD

In other words

Given two equiangular triangles ABC and CDE, where the angle α equals angle δ, γ equals θ, and finally β equals ε, then…

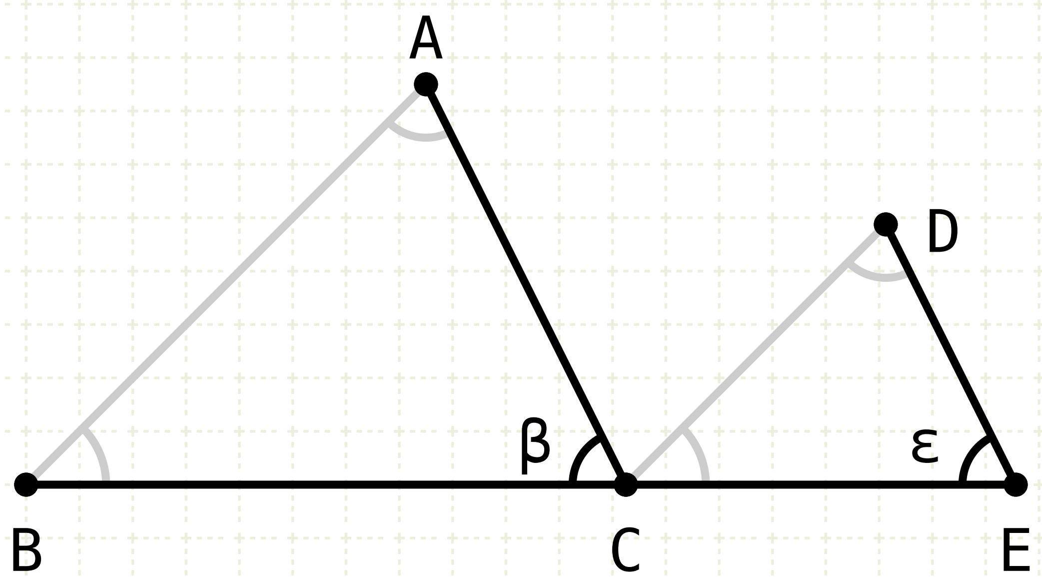
The ratio of the sides (BC, CE) subtending the angles γ and θ is proportional to the ratio of the sides (AC, DE) subtending the angles α and δ, etc.

Also, the ratio of the lines on either side of an angle in one triangle will be equal to the ratio of the lines in the other triangle which are on either side of the equal angle. AB to BC equals DE to CE, AC to BC equals DE to CE and AC to BC equals DE to CE

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.

$\alpha = \delta, \ \beta = \varepsilon, \ \gamma = \theta$



BC:CE = AC:DE = AB:CD

AB:AC = CD:DE
BC:AB = CE:CD
BC:AC = CE:DE

In other words

Given two equiangular triangles ABC and CDE, where the angle α equals angle δ, γ equals θ, and finally β equals ε, then…

The ratio of the sides (BC, CE) subtending the angles γ and θ is proportional to the ratio of the sides (AC, DE) subtending the angles α and δ, etc.

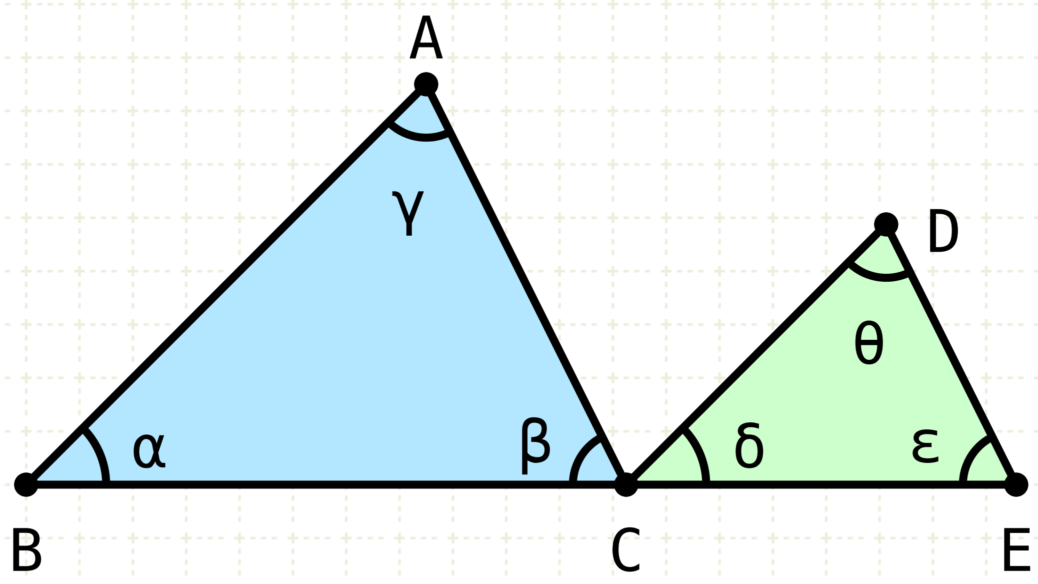
Also, the ratio of the lines on either side of an angle in one triangle will be equal to the ratio of the lines in the other triangle which are on either side of the equal angle. AB to BC equals DE to CE, AC to BC equals DE to CE and AC to BC equals DE to CE

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.

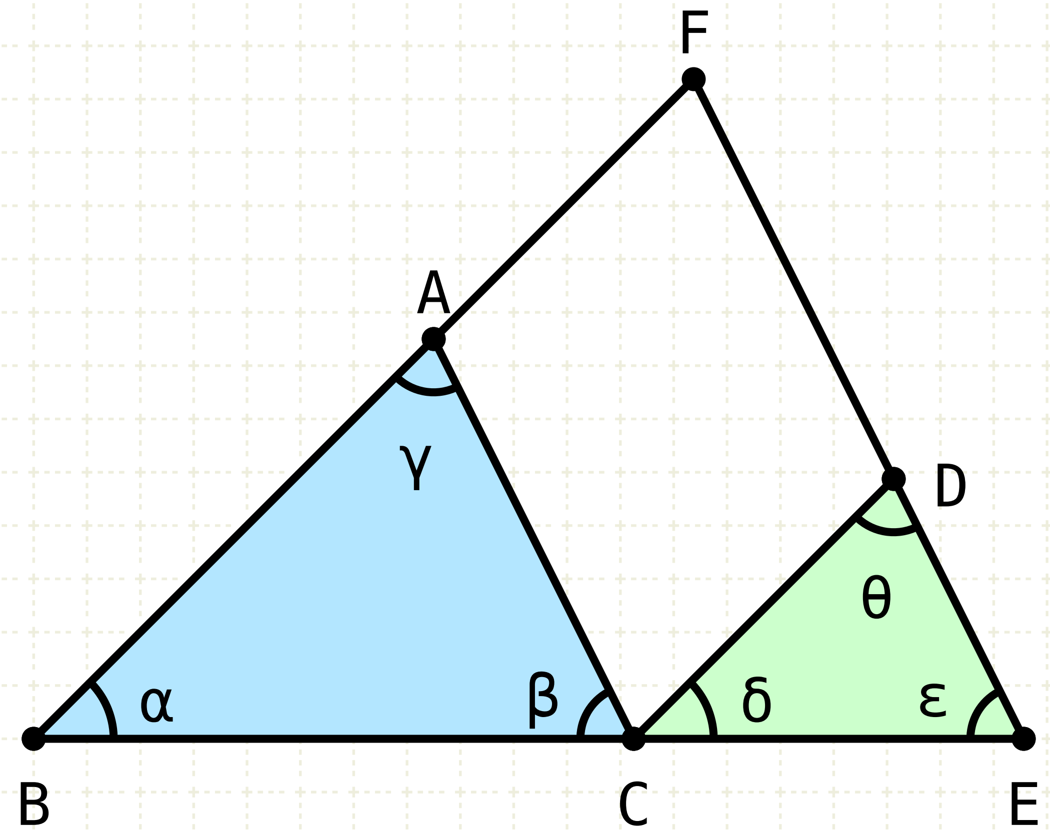
$\alpha = \delta, \ \beta = \varepsilon, \ \gamma = \theta$

Proof



Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.



$\alpha = \delta, \ \beta = \varepsilon, \ \gamma = \theta$

$\alpha + \beta < 2\cdot\llcorner$
$\beta = \varepsilon$
$\alpha + \varepsilon < 2\cdot\llcorner$

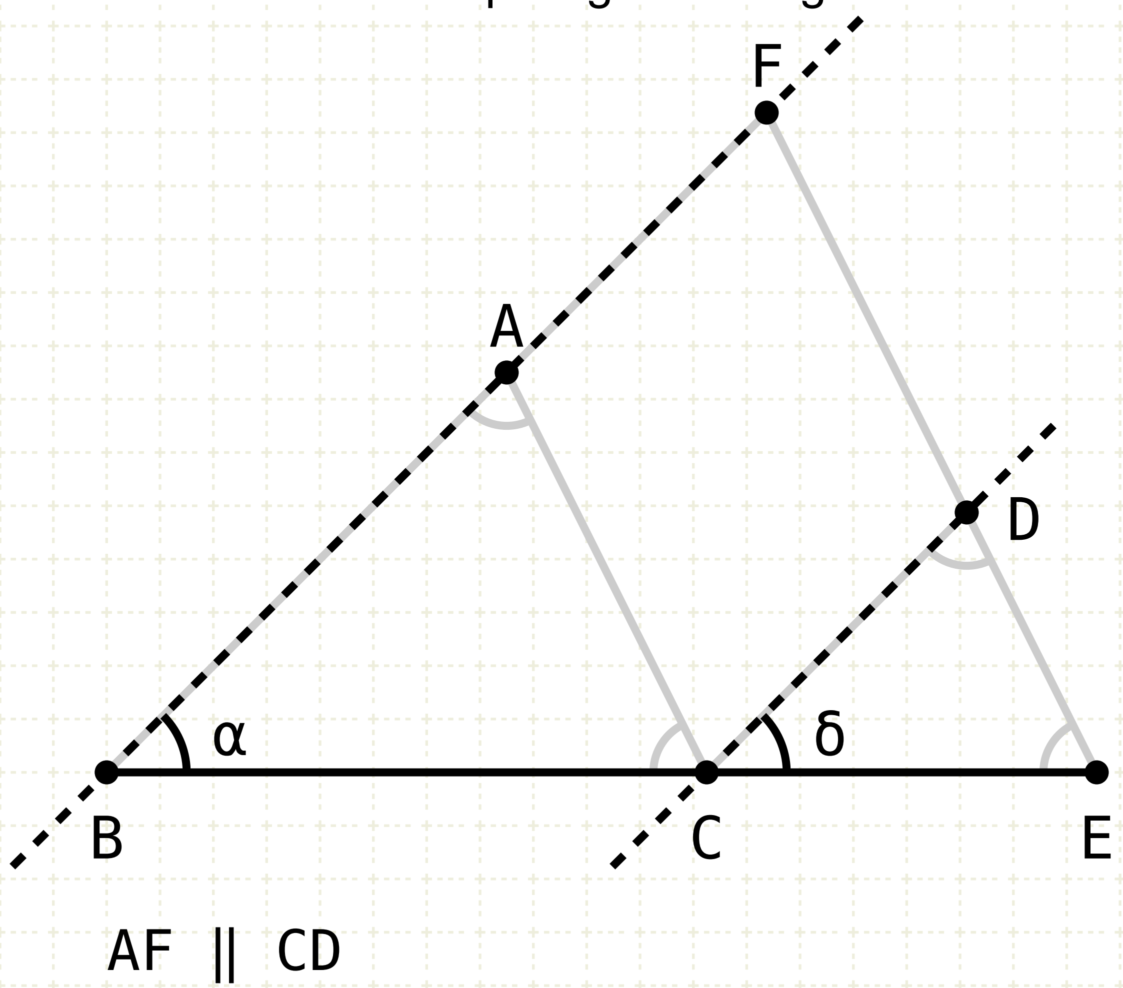
Proof

Since the sum of the angles α and β are less than two right angles (I .17), and the angles β and ε are equal, …

… the sum of the angles α and ε are less than two right angles, thus the lines AB and DE will meet (at point F) if extended (I·Post·5)

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.



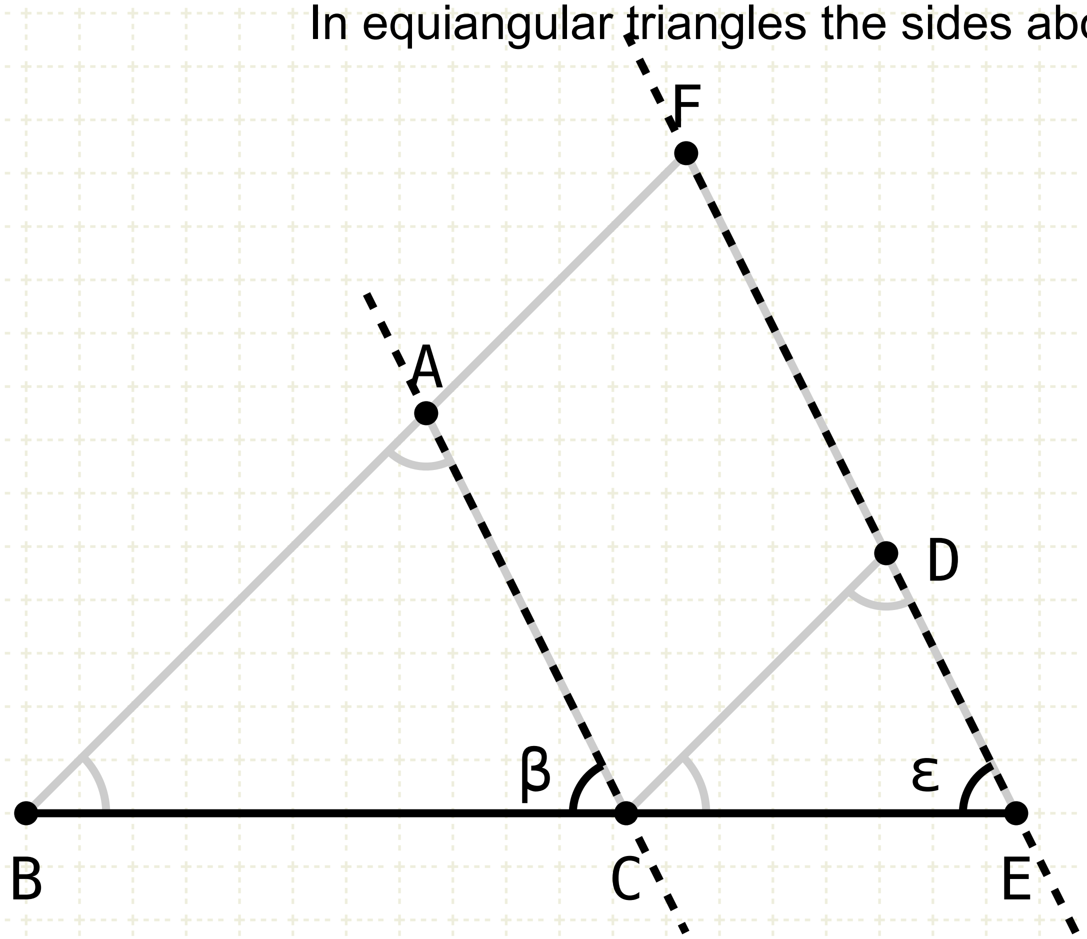
$\alpha = \delta,\ \beta = \varepsilon,\ \gamma = \theta$

Proof

Since α equals δ, AF is parallel to CD (I·28)

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.



$\alpha = \delta$, $\beta = \varepsilon$, $\gamma = \theta$

AF || CD

AC || FE

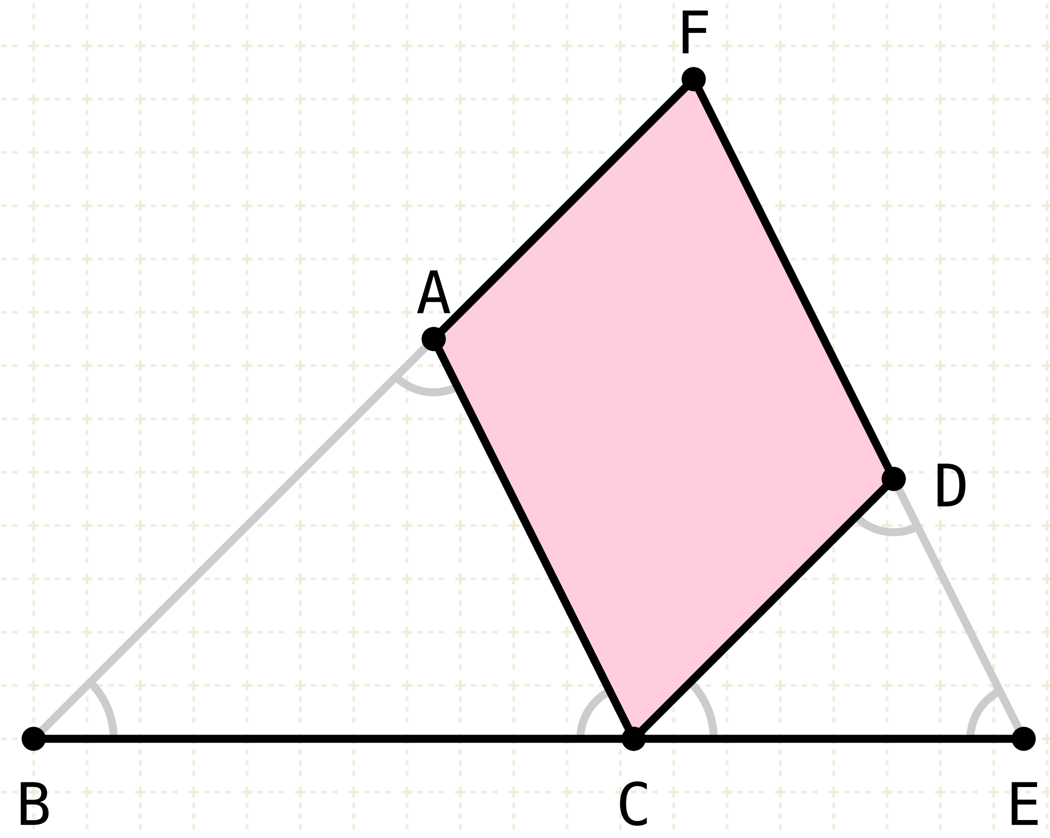
Proof

Since α equals δ, AF is parallel to CD (I·28)

Similarly, since β equals ε, AC is parallel to FE (I·28)

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.



$\alpha = \delta, \ \beta = \varepsilon, \ \gamma = \theta$

$AF \parallel CD$

$AC \parallel FE$

$AF = CD$

$AC = FD$

Proof

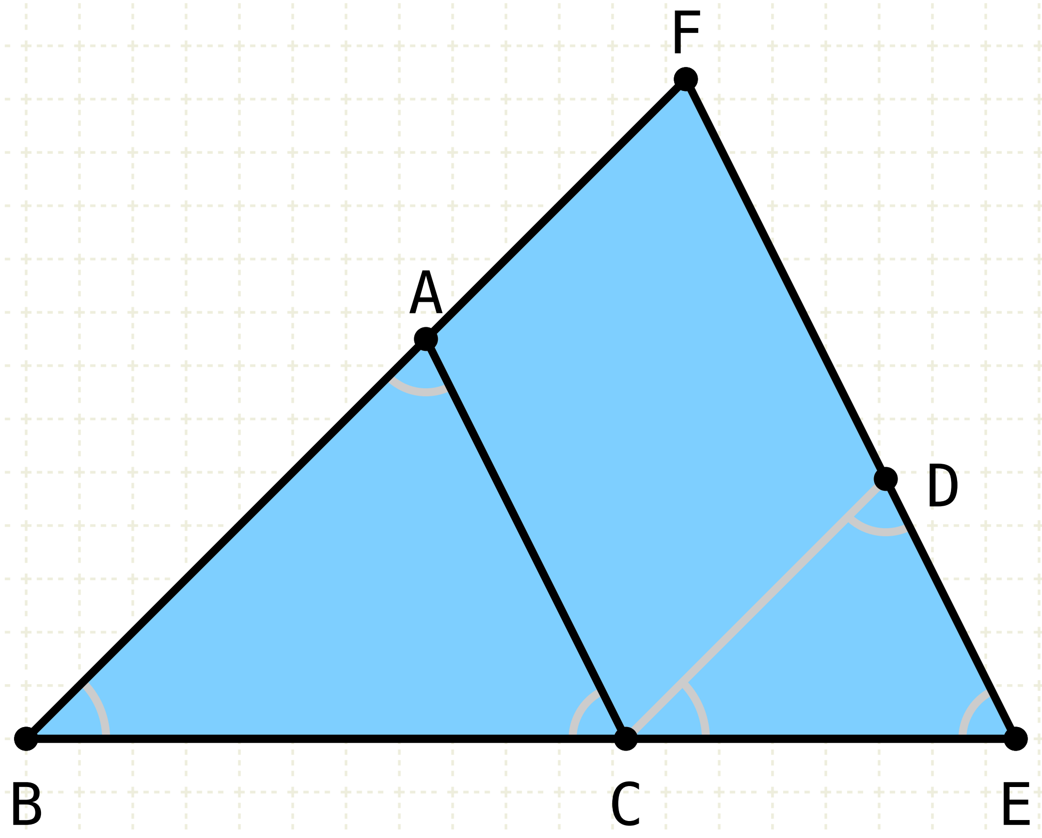
Since α equals δ, AF is parallel to CD (I·28)

Similarly, since β equals ε, AC is parallel to FE (I·28)

Therefore FACD is a parallelogram, and AF, CD are equal as are AC, FD (I·34)

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.



$\alpha = \delta,\ \beta = \varepsilon,\ \gamma = \theta$

AF || CD

AC || FE

AF = CD

AC = FD

AB:AF = BC:CE

Proof

Since α equals δ, AF is parallel to CD (I·28)

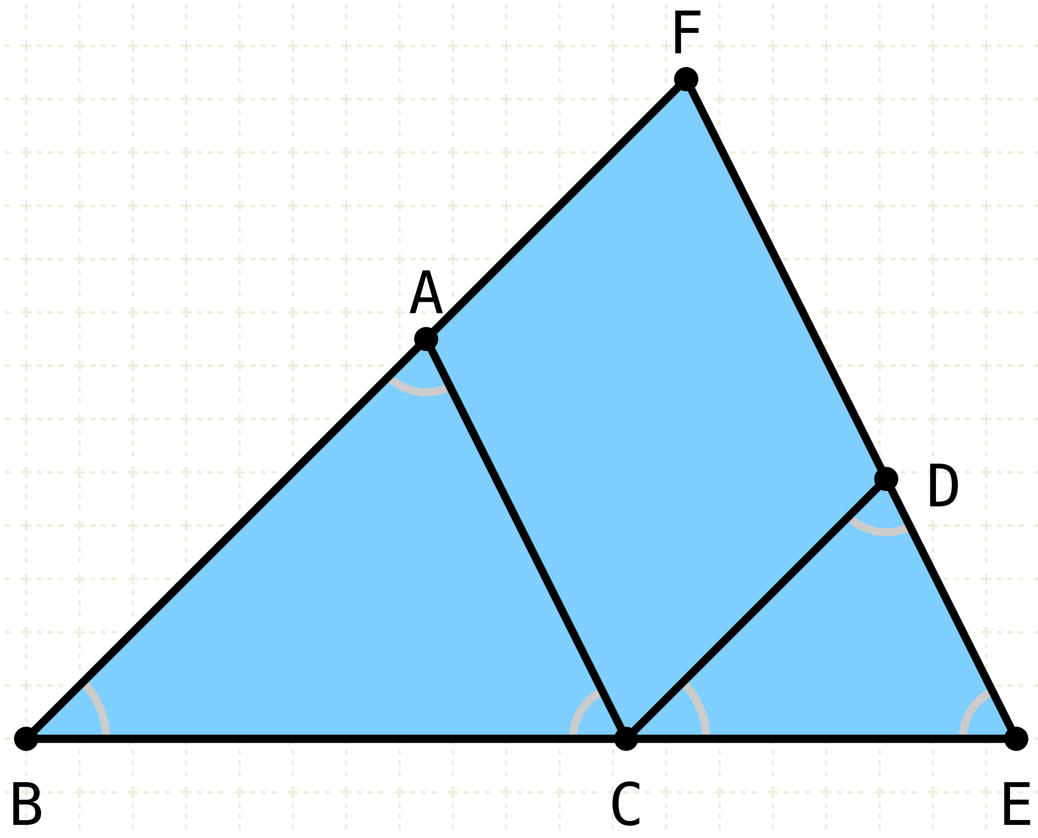
Similarly, since β equals ε, AC is parallel to FE (I·28)

Therefore FACD is a parallelogram, and AF, CD are equal as are AC, FD (I·34)

Since AC is parallel FE, the ratios AB to AF and BC to CE are equal (VI·2)

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.



$\alpha = \delta$, $\beta = \varepsilon$, $\gamma = \theta$

$AF \parallel CD$

$AC \parallel FE$

$AF = CD$

$AC = FD$

$AB:AF = BC:CE$

$AB:CD = BC:CE$

Proof

Since α equals δ, AF is parallel to CD (I·28)

Similarly, since β equals ε, AC is parallel to FE (I·28)

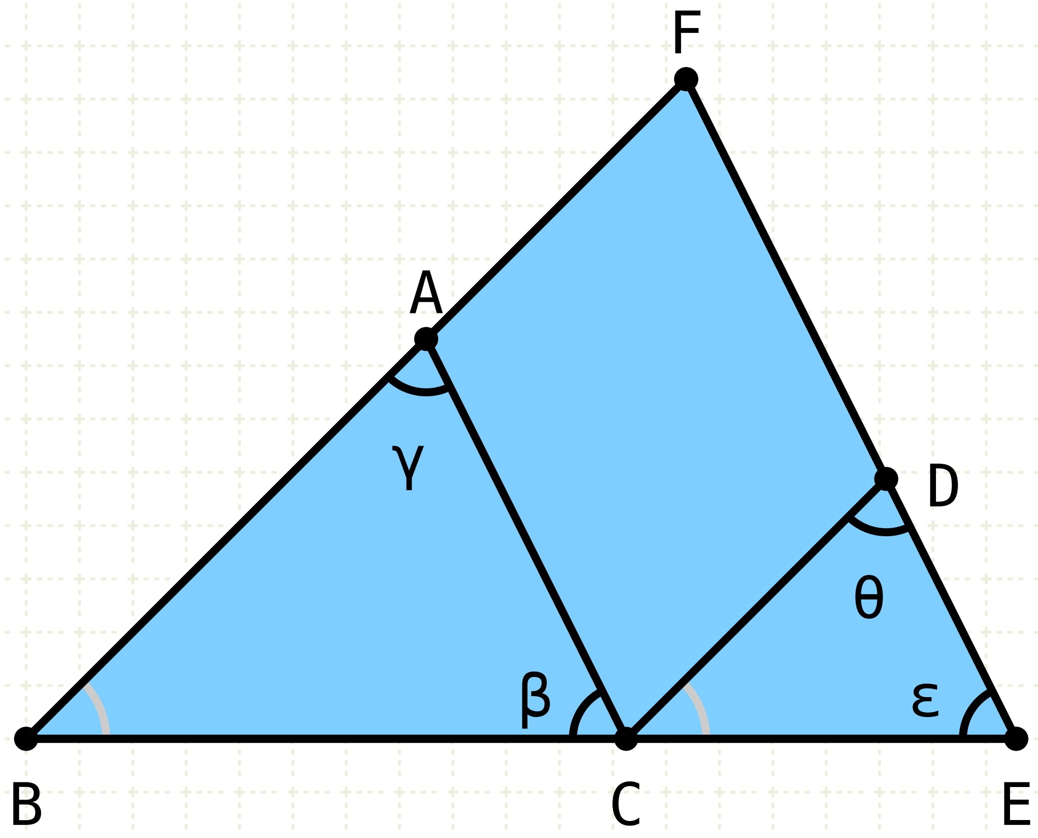
Therefore FACD is a parallelogram, and AF, CD are equal as are AC, FD (I·34)

Since AC is parallel FE, the ratios AB to AF and BC to CE are equal (VI·2)

But since AF equals CD, AB to CD is equal to BC to CE (V·16)

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.



$\alpha = \delta$, $\beta = \varepsilon$, $\gamma = \theta$

AB:CD = BC:CE

AF || CD

AC || FE

AF = CD

AC = FD

AB:AF = BC:CE

AB:CD = BC:CE

Proof

Since α equals δ, AF is parallel to CD (I·28)

Similarly, since β equals ε, AC is parallel to FE (I·28)

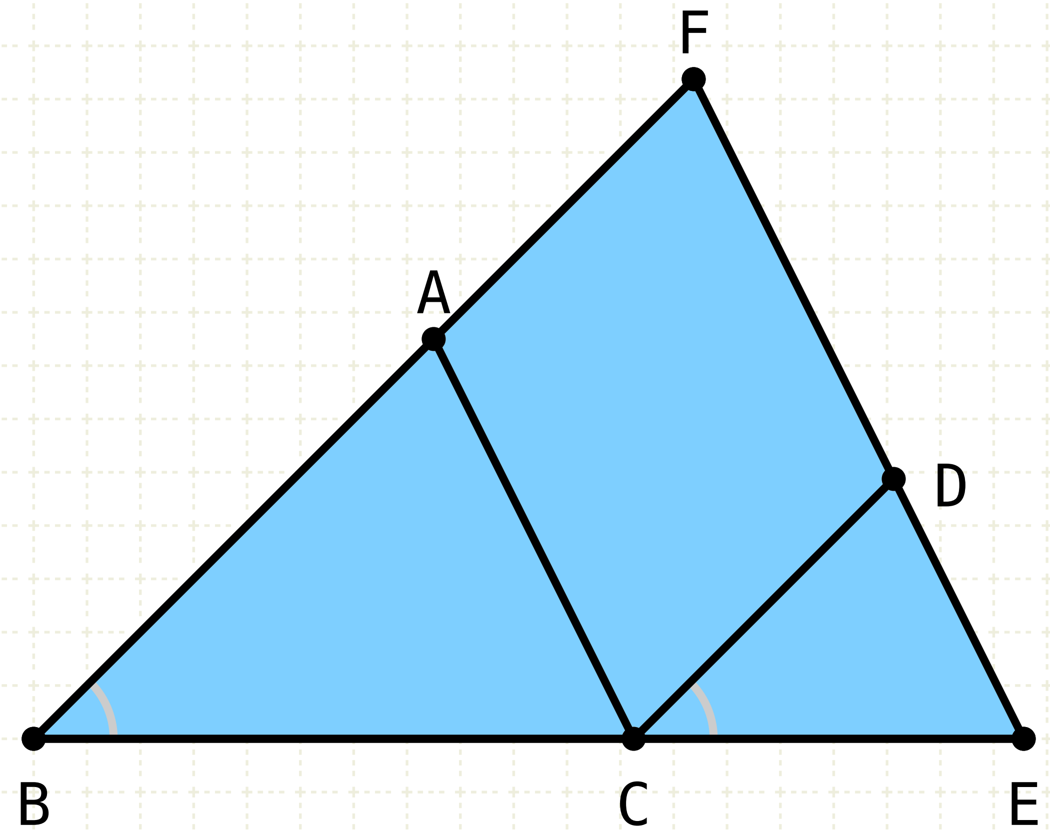
Therefore FACD is a parallelogram, and AF, CD are equal as are AC, FD (I·34)

Since AC is parallel FE, the ratios AB to AF and BC to CE are equal (VI·2)

But since AF equals CD, AB to CD is equal to BC to CE (V·16)

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.



$\alpha = \delta$, $\beta = \varepsilon$, $\gamma = \theta$

AB:CD = BC:CE

AF || CD

AC || FE

AF = CD

AC = FD

AB:AF = BC:CE

AB:CD = BC:CE

AB:BC = CD:CE

Proof

Since α equals δ, AF is parallel to CD (I·28)

Similarly, since β equals ε, AC is parallel to FE (I·28)

Therefore FACD is a parallelogram, and AF, CD are equal as are AC, FD (I·34)

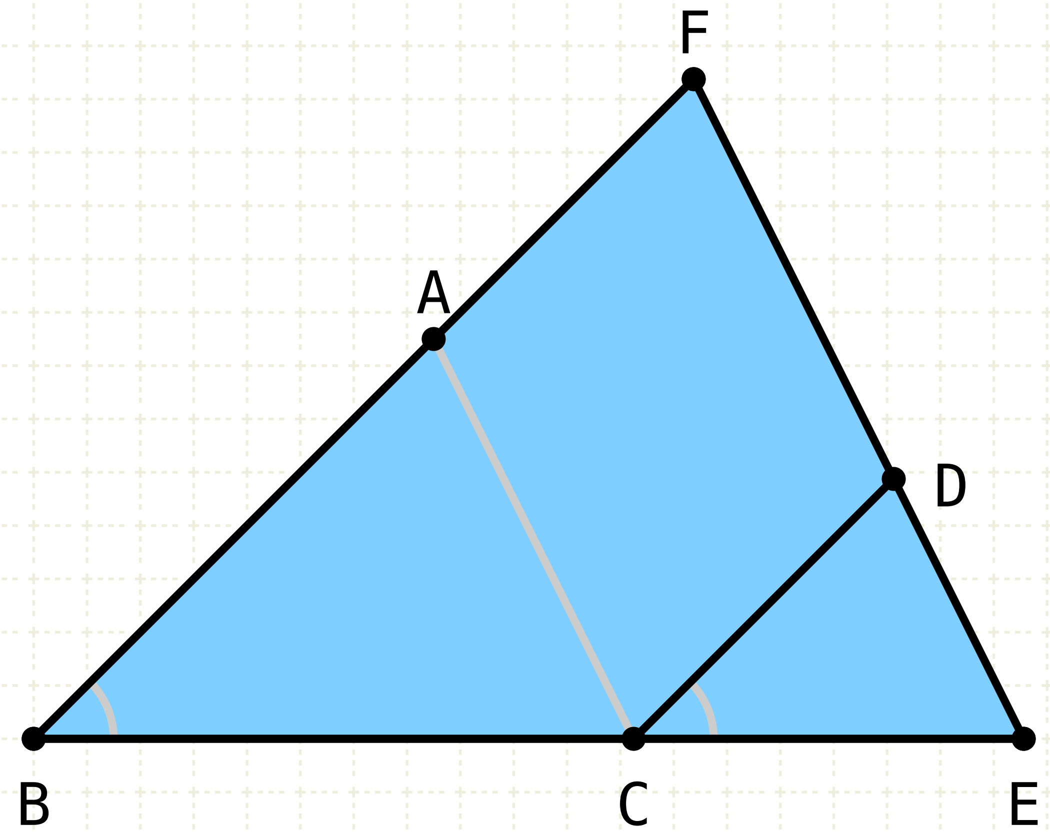
Since AC is parallel FE, the ratios AB to AF and BC to CE are equal (VI·2)

But since AF equals CD, AB to CD is equal to BC to CE (V·16)

And alternately AB to BC is equal to CD to CE (V·16)

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.



$\alpha = \delta$, $\beta = \varepsilon$, $\gamma = \theta$

AB:CD = BC:CE

AF || CD

AC || FE

AF = CD

AC = FD

AB:AF = BC:CE

AB:CD = BC:CE

AB:BC = CD:CE

FD:DE = BC:CE

Proof

Since α equals δ, AF is parallel to CD (I·28)

Similarly, since β equals ε, AC is parallel to FE (I·28)

Therefore FACD is a parallelogram, and AF, CD are equal as are AC, FD (I·34)

Since AC is parallel FE, the ratios AB to AF and BC to CE are equal (VI·2)

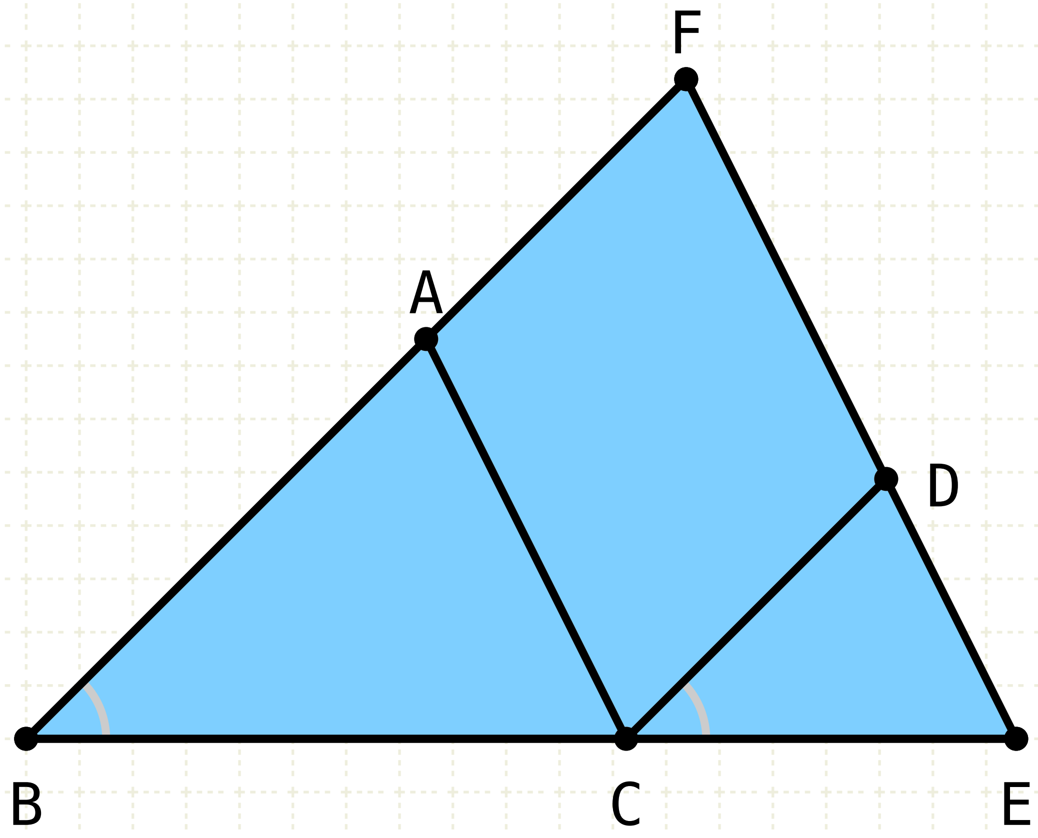
But since AF equals CD, AB to CD is equal to BC to CE (V·16)

And alternately AB to BC is equal to CD to CE (V·16)

Since CD is parallel BF, therefore the ratios FD to DE and BC to CE are equal (VI·2)

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.



$\alpha = \delta$, $\beta = \varepsilon$, $\gamma = \theta$

AB:CD = BC:CE

AF || CD

AC || FE

AF = CD

AC = FD

AB:AF = BC:CE

AB:CD = BC:CE

AB:BC = CD:CE

FD:DE = BC:CE

AC:DE = BC:CE

Proof

Since α equals δ, AF is parallel to CD (I·28)

Similarly, since β equals ε, AC is parallel to FE (I·28)

Therefore FACD is a parallelogram, and AF, CD are equal as are AC, FD (I·34)

Since AC is parallel FE, the ratios AB to AF and BC to CE are equal (VI·2)

But since AF equals CD, AB to CD is equal to BC to CE (V·16)

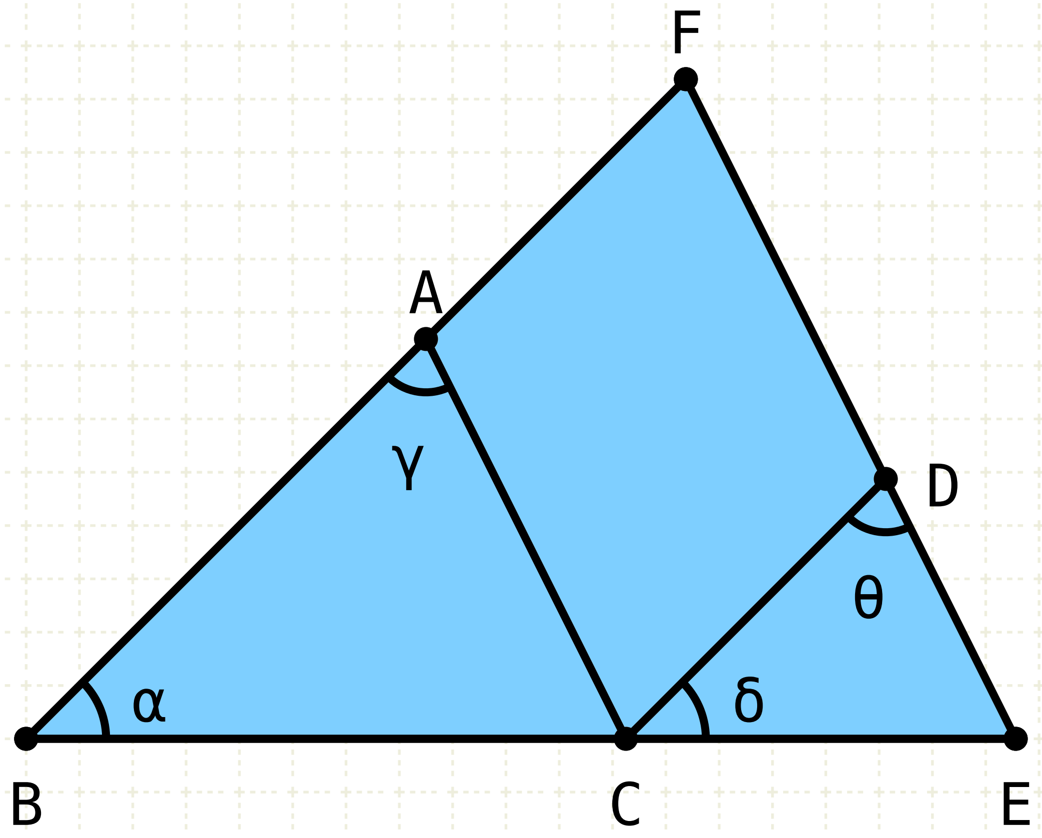
And alternately AB to BC is equal to CD to CE (V·16)

Since CD is parallel BF, therefore the ratios FD to DE and BC to CE are equal (VI·2)

But since AC equals FD, AC to DE is equal to BC to CE (V·16)

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.



$\alpha = \delta$, $\beta = \varepsilon$, $\gamma = \theta$

AB:CD = BC:CE

AC:DE = BC:CE

AF || CD

AC || FE

AF = CD

AC = FD

AB:AF = BC:CE

AB:CD = BC:CE

AB:BC = CD:CE

FD:DE = BC:CE

AC:DE = BC:CE

Proof

Since α equals δ, AF is parallel to CD (I·28)

Similarly, since β equals ε, AC is parallel to FE (I·28)

Therefore FACD is a parallelogram, and AF, CD are equal as are AC, FD (I·34)

Since AC is parallel FE, the ratios AB to AF and BC to CE are equal (VI·2)

But since AF equals CD, AB to CD is equal to BC to CE (V·16)

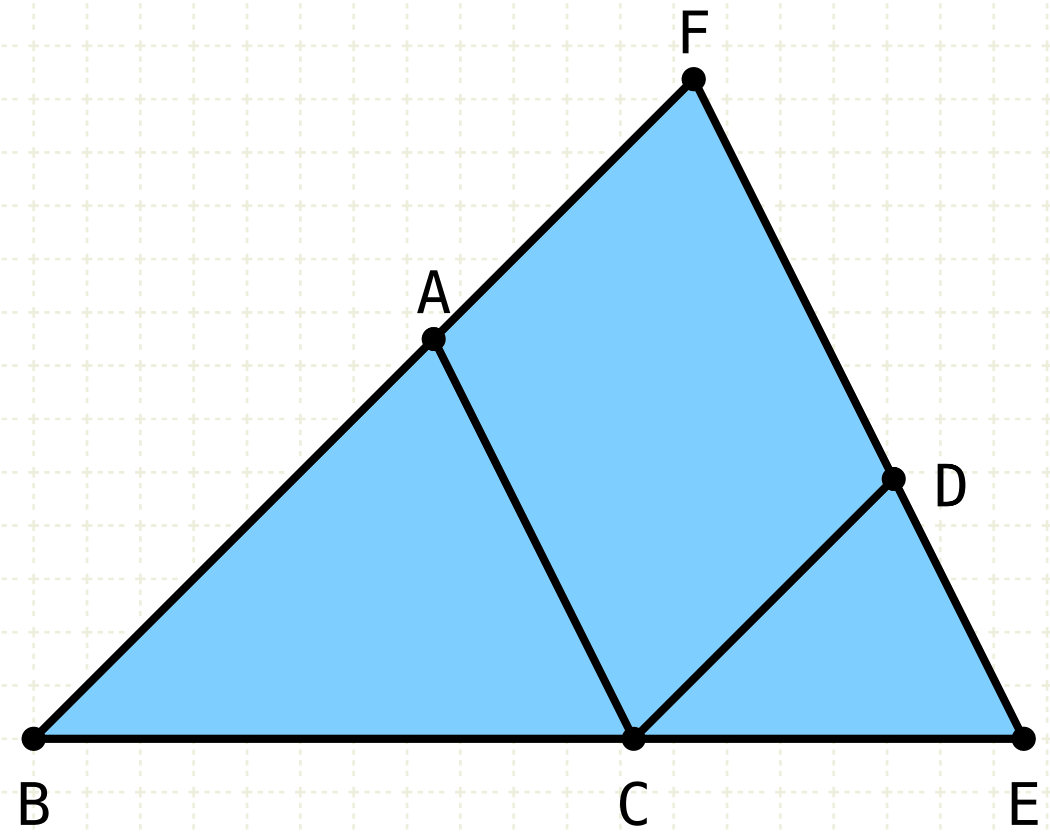
And alternately AB to BC is equal to CD to CE (V·16)

Since CD is parallel BF, therefore the ratios FD to DE and BC to CE are equal (VI·2)

But since AC equals FD, AC to DE is equal to BC to CE (V·16)

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.



$\alpha = \delta$, $\beta = \varepsilon$, $\gamma = \theta$

AB:CD = BC:CE

AC:DE = BC:CE

AF || CD

AC || FE

AF = CD

AC = FD

AB:AF = BC:CE

AB:CD = BC:CE

AB:BC = CD:CE

FD:DE = BC:CE

AC:DE = BC:CE

AC:BC = DE:CE

Proof

Since α equals δ, AF is parallel to CD (I·28)

Similarly, since β equals ε, AC is parallel to FE (I·28)

Therefore FACD is a parallelogram, and AF, CD are equal as are AC, FD (I·34)

Since AC is parallel FE, the ratios AB to AF and BC to CE are equal (VI·2)

But since AF equals CD, AB to CD is equal to BC to CE (V·16)

And alternately AB to BC is equal to CD to CE (V·16)

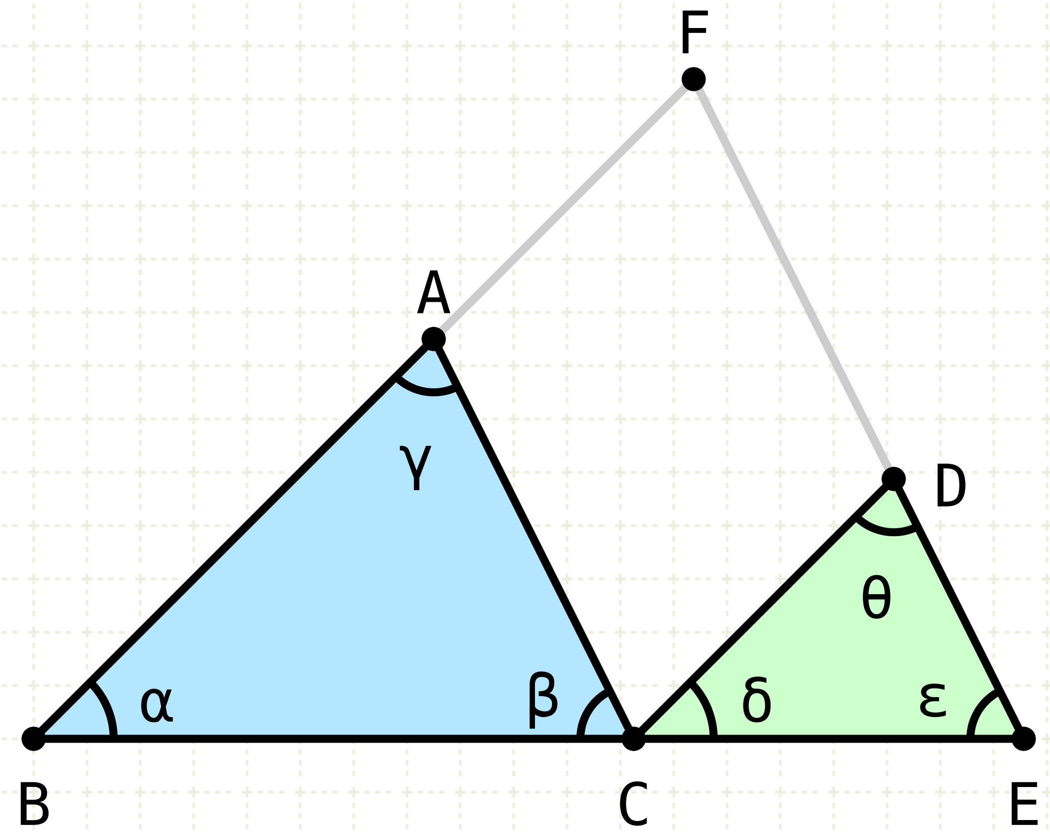
Since CD is parallel BF, therefore the ratios FD to DE and BC to CE are equal (VI·2)

But since AC equals FD, AC to DE is equal to BC to CE (V·16)

And alternately AC to BC is equal to DE to CE (V·16)

Proposition 4 of Book VI

In equiangular triangles the sides about the equal angles are proportional, and those are corresponding sides which subtend the equal angles.



$\alpha = \delta,\ \beta = \varepsilon,\ \gamma = \theta$

AB:CD = BC:CE

AC:DE = BC:CE

AF || CD

AC || FE

AF = CD

AC = FD

AB:AF = BC:CE

AB:CD = BC:CE

AB:BC = CD:CE

FD:DE = BC:CE

AC:DE = BC:CE

AC:BC = DE:CE

AB:AC = CD:DE

Proof

Since α equals δ, AF is parallel to CD (I·28)

Similarly, since β equals ε, AC is parallel to FE (I·28)

Therefore FACD is a parallelogram, and AF, CD are equal as are AC, FD (I·34)

Since AC is parallel FE, the ratios AB to AF and BC to CE are equal (VI·2)

But since AF equals CD, AB to CD is equal to BC to CE (V·16)

And alternately AB to BC is equal to CD to CE (V·16)

Since CD is parallel BF, therefore the ratios FD to DE and BC to CE are equal (VI·2)

But since AC equals FD, AC to DE is equal to BC to CE (V·16)

And alternately AC to BC is equal to DE to CE (V·16)

Since AB is to BC, so is CD to CE, and as BC is to AC, so is CE to DE, therefore AB is is to AC so is CD to DE (V·22)

Youtube Videos

https://www.youtube.com/c/SandyBultena