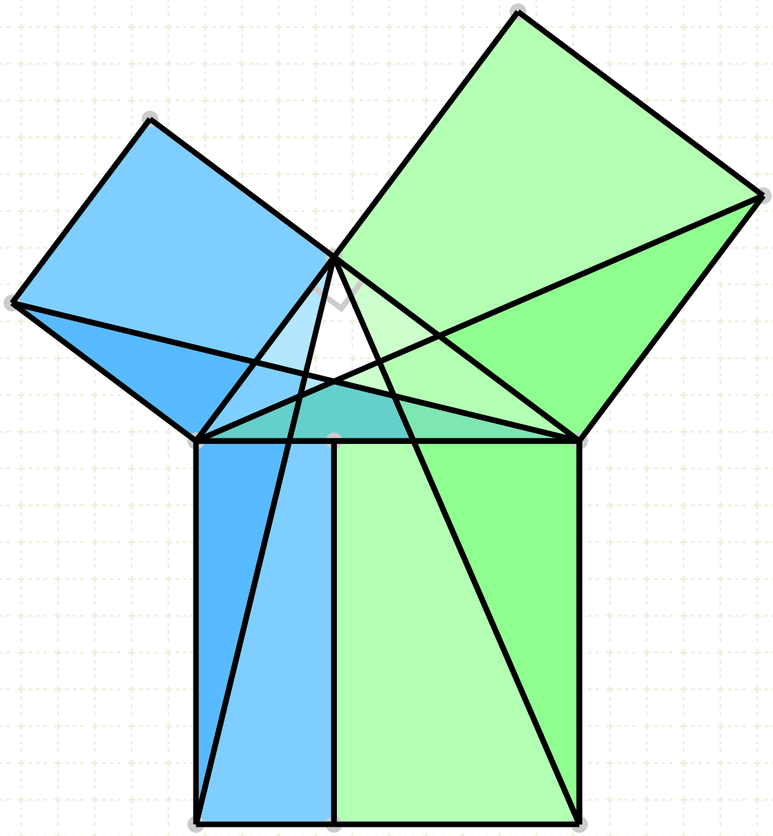
Euclid's Elements

Book I



If Euclid did not kindle your youthful enthusiasm, you were not born to be a scientific thinker.

Albert Einstein

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Proposition 23 of Book I

To construct a rectilinear angle equal to a given rectilinear angle on a given straight line and at a point on it.

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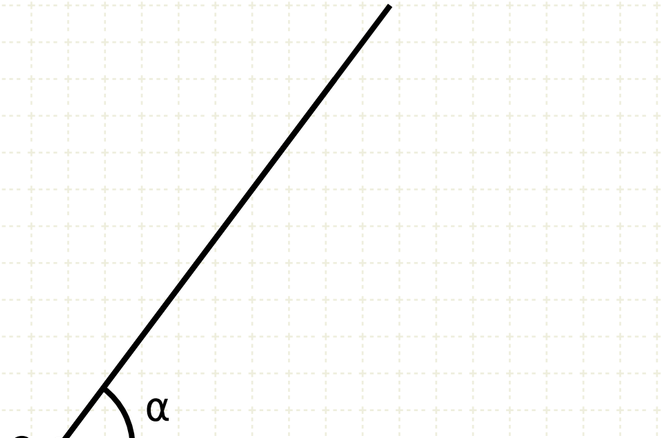
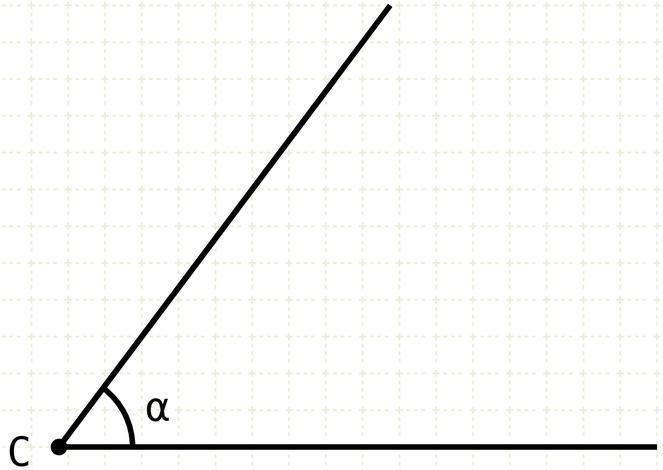


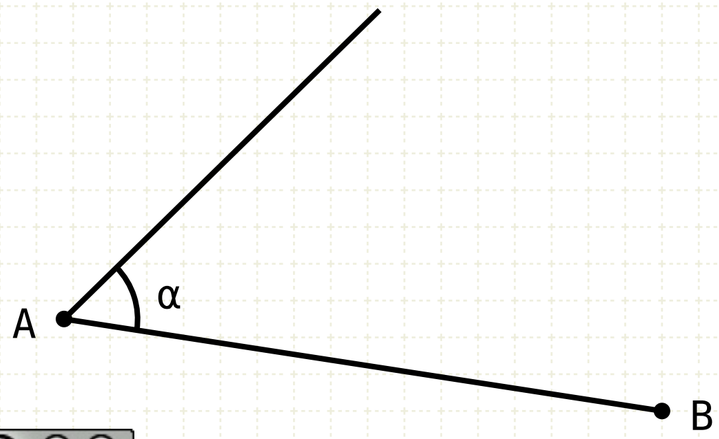
In other words

Given an angle and a line AB

Proposition 23 of Book I

To construct a rectilinear angle equal to a given rectilinear angle on a given straight line and at a point on it.





In other words

Given an angle and a line AB

Draw a new line on point A such that it forms an angle equivalent to the original

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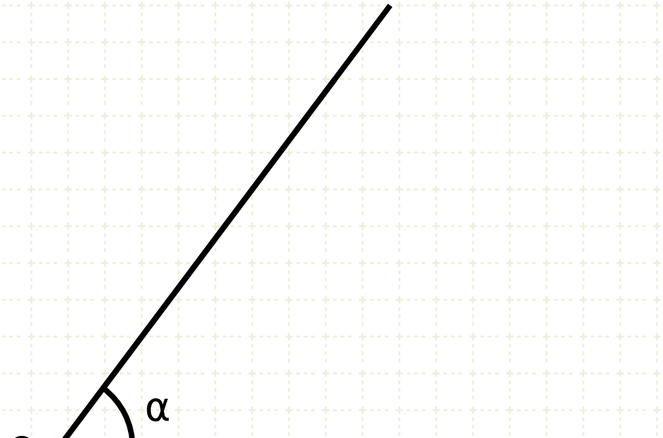

Construction

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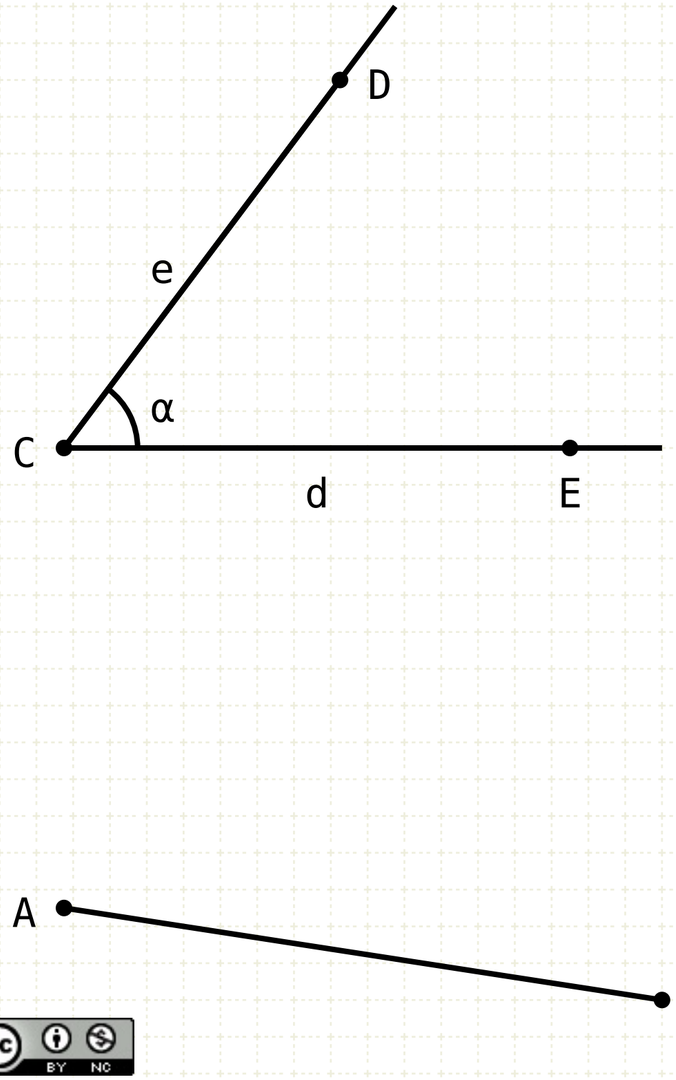

Construction

Define points D and E at random on the two lines defining the angle

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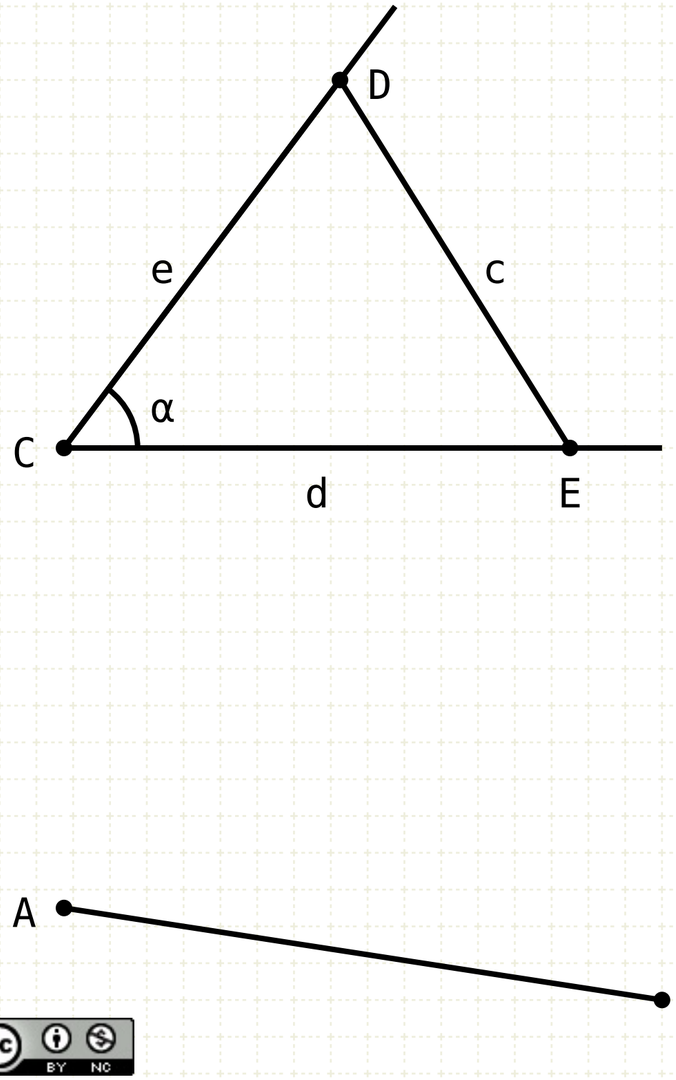

Construction

Define points D and E at random on the two lines defining the angle

Construct triangle DCE by constructing the line DE

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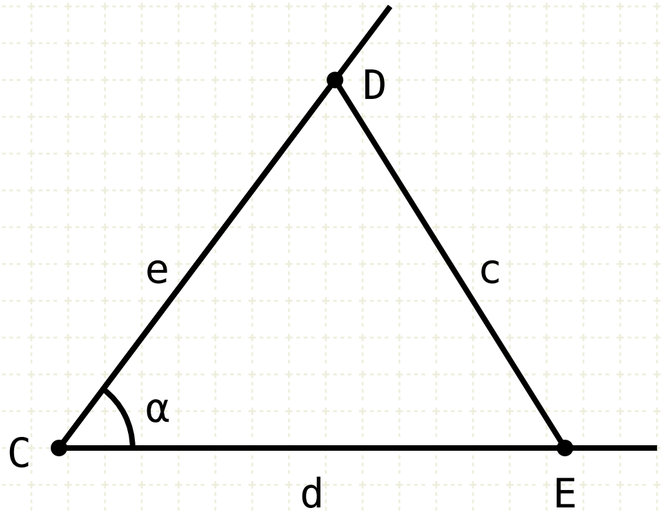


Construction

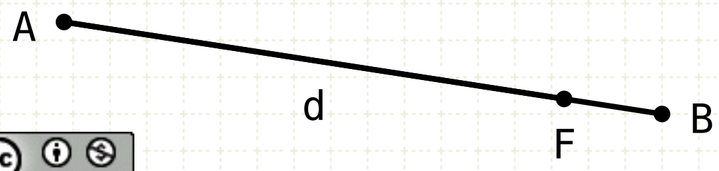
Define points D and E at random on the two lines defining the angle

Construct triangle DCE by constructing the line DE

Copy this triangle onto line segment AB, using the methods described in I·22

- Copy length CE to AF (I·2)

AF = CE



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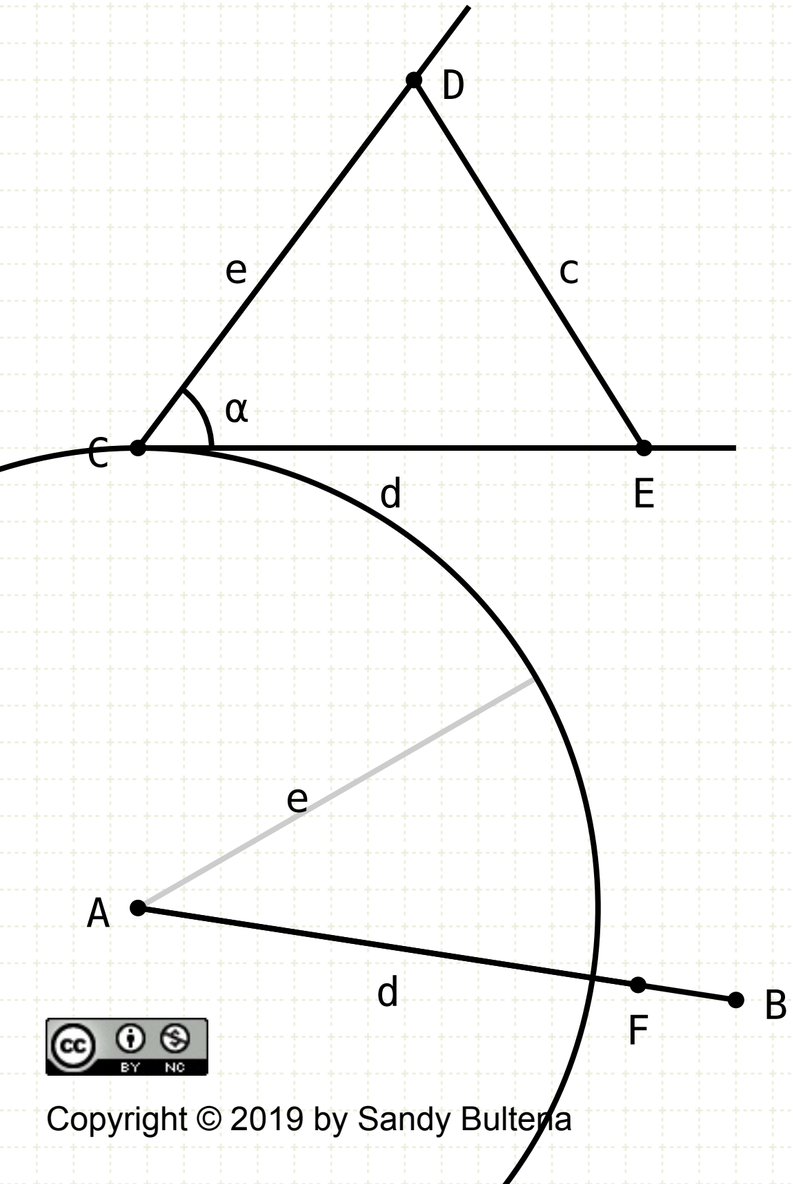

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- Copy length CE to AF (I·2)
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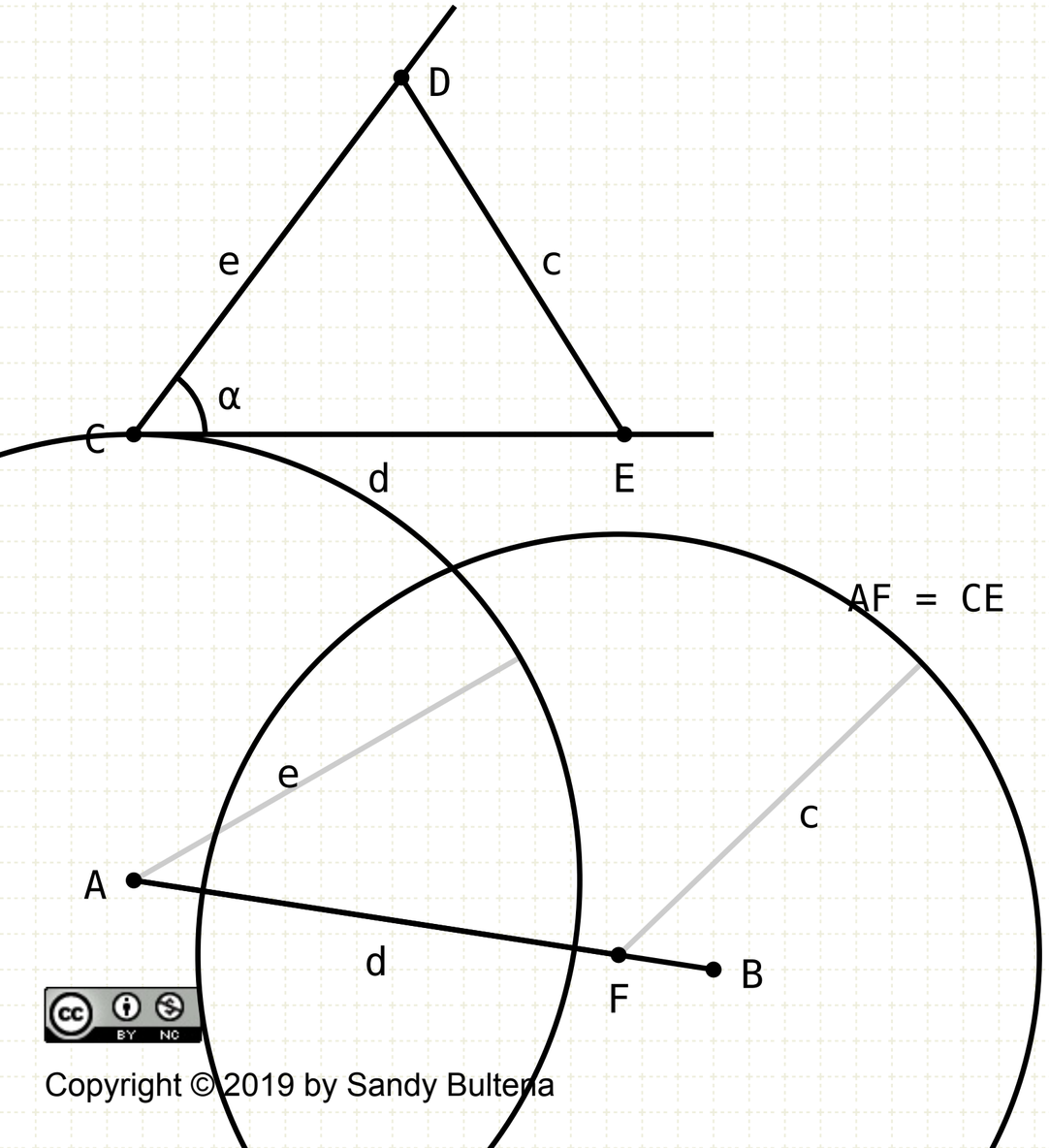

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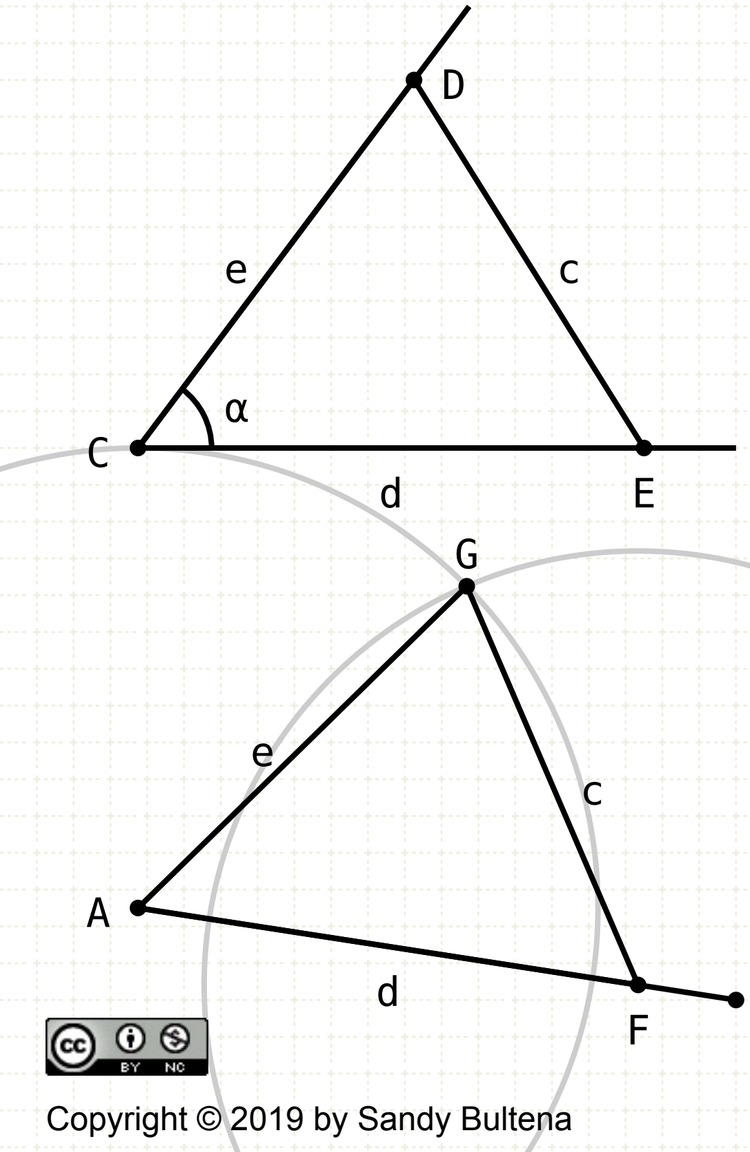

AF = CE
AG = CD
FG = ED

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- Construct triangle AFG, where G is the intersection of the two circles

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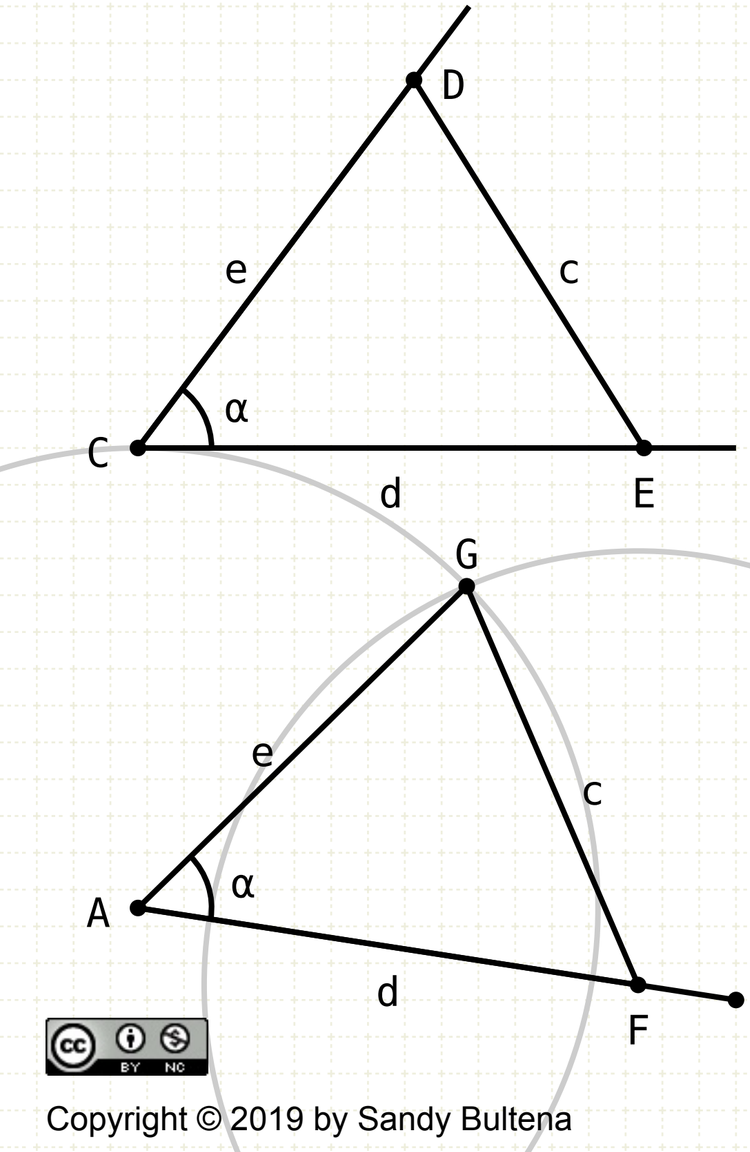

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Angle GAF is equal to DCE

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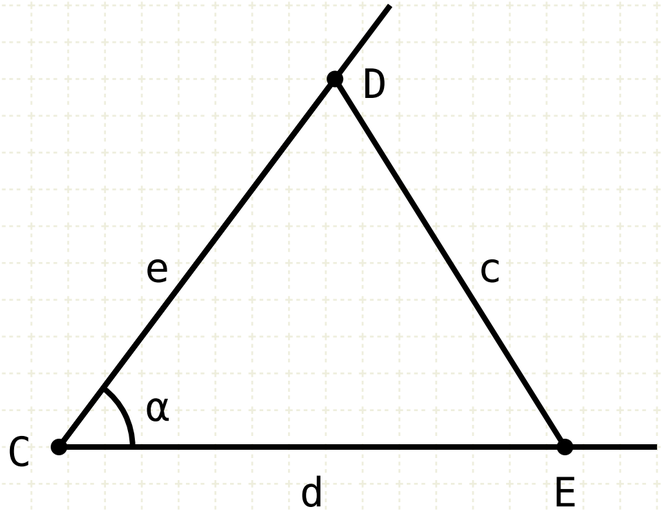

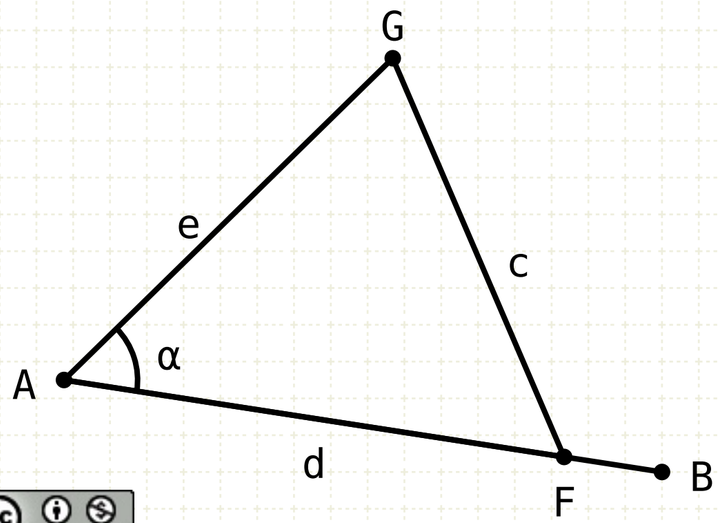

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Proof

Two triangles where all three sides are equivalent, have equivalent angles (I·8)

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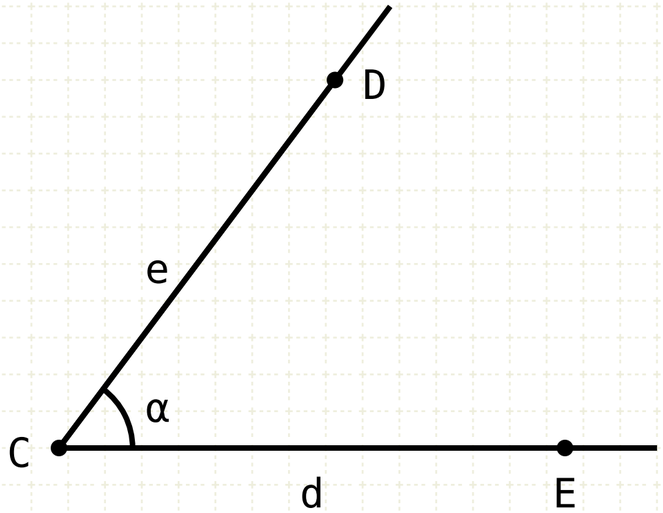

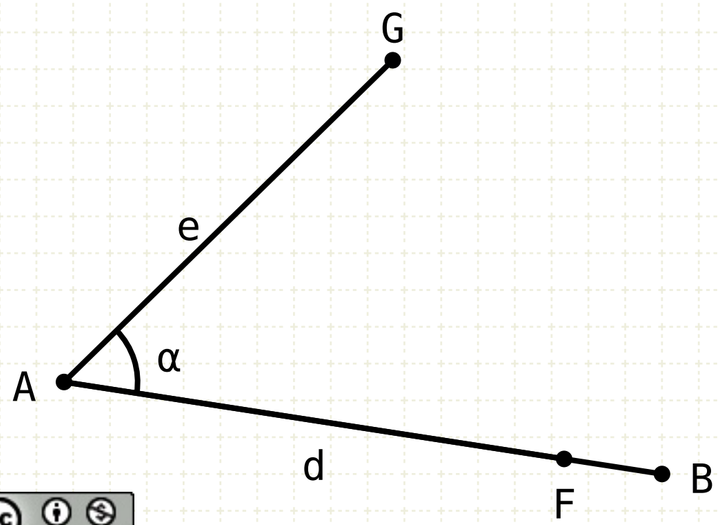

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