

Euclid's Elements

Book I

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

Albert Einstein

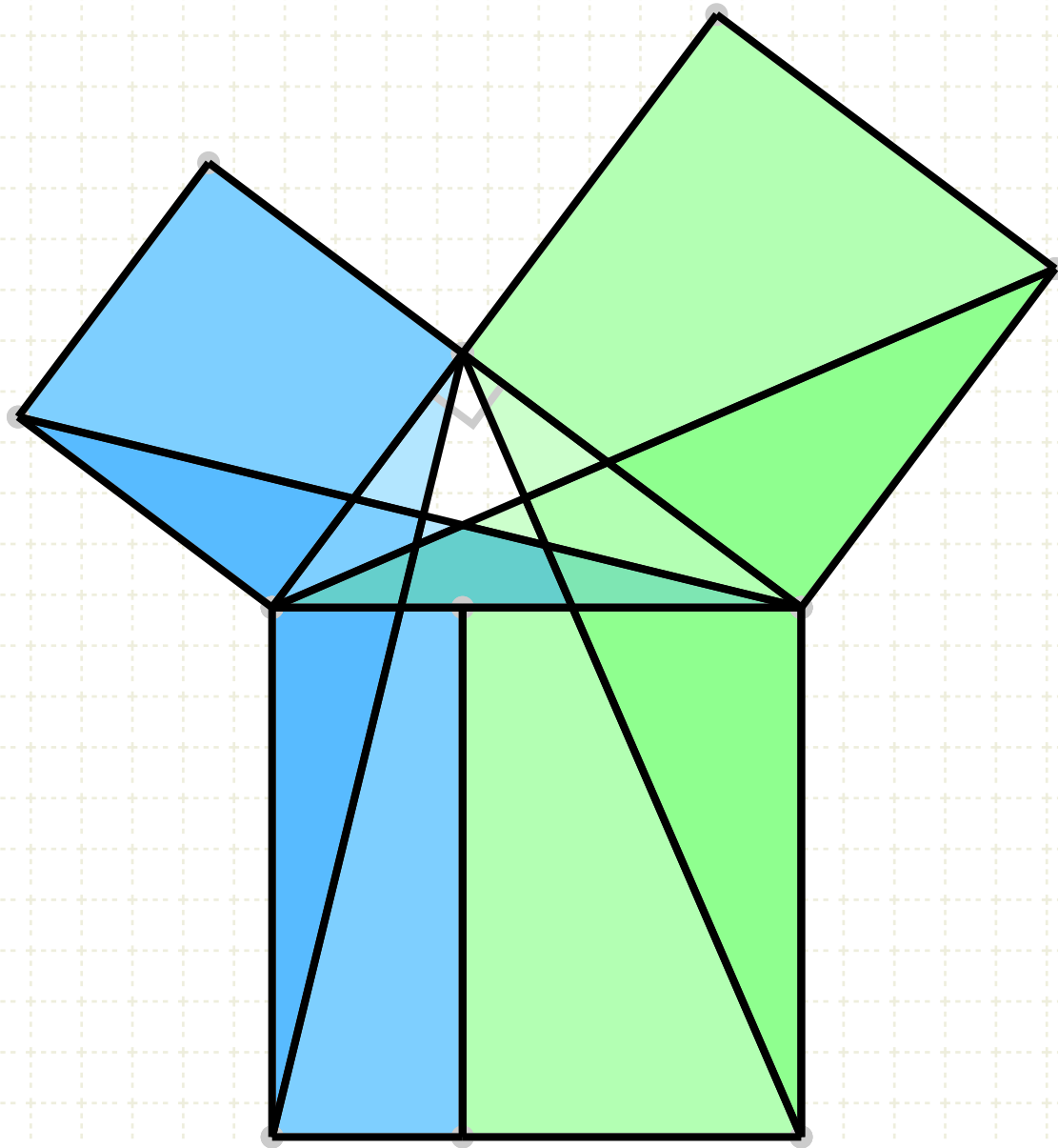


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Proposition 31 of Book I

To draw a straight line through a given point parallel to a given straight line.



Proposition 31 of Book I

To draw a straight line through a given point parallel to a given straight line.

In other words

To draw a straight line through a given point parallel to a given straight line.

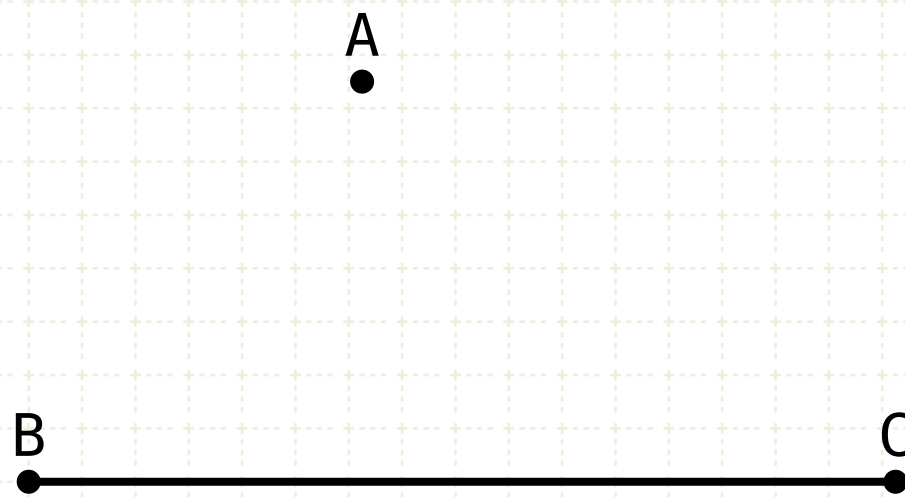


Proposition 31 of Book I

To draw a straight line through a given point parallel to a given straight line.

Construction

Start with line BC and point A not on line BC



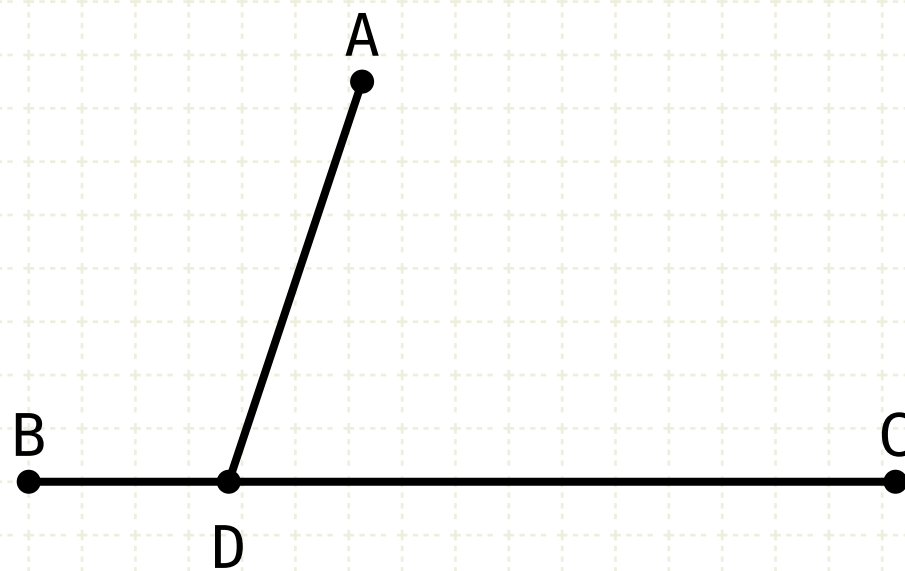
Proposition 31 of Book I

To draw a straight line through a given point parallel to a given straight line.

Construction

Start with line BC and point A not on line BC

Define a point D on the line BC, and create line AD



Proposition 31 of Book I

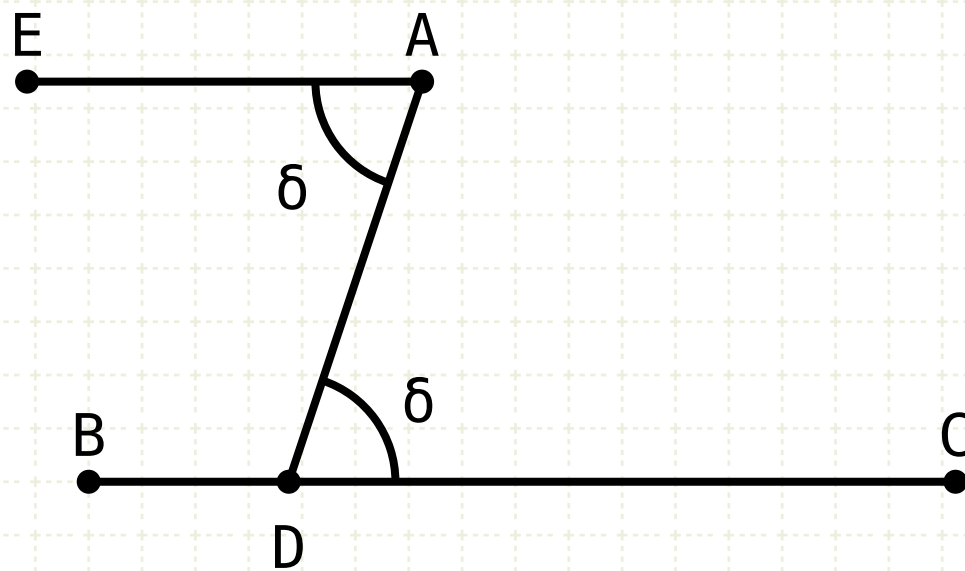
To draw a straight line through a given point parallel to a given straight line.

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Start with line BC and point A not on line BC

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Copy angle ADC on line AD at point A (I.23)



Proposition 31 of Book I

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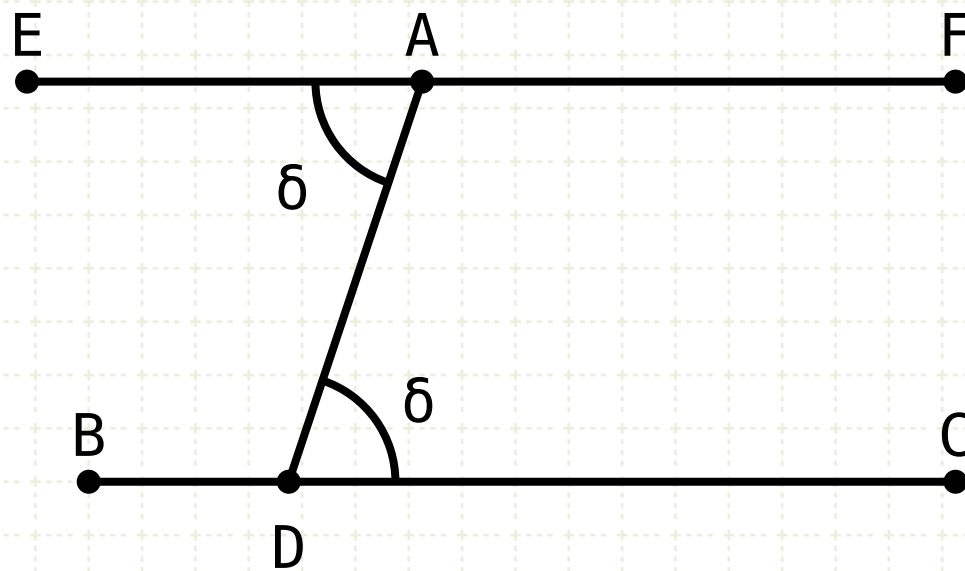
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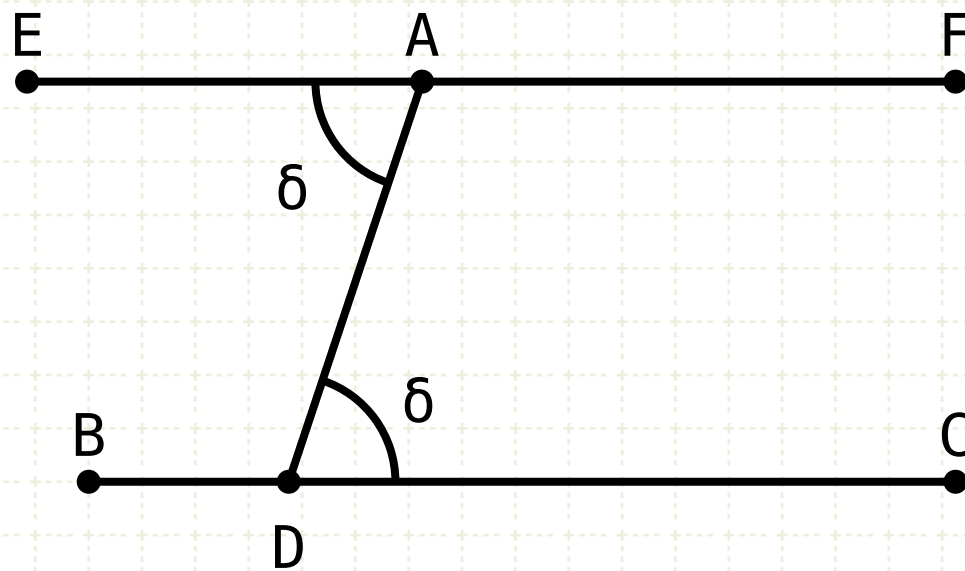
Extend line EA to AF



Proposition 31 of Book I

To draw a straight line through a given point parallel to a given straight line.

$EF \parallel BC$



Construction

Start with line BC and point A not on line BC

Define a point D on the line BC, and create line AD

Copy angle ADC on line AD at point A (I.23)

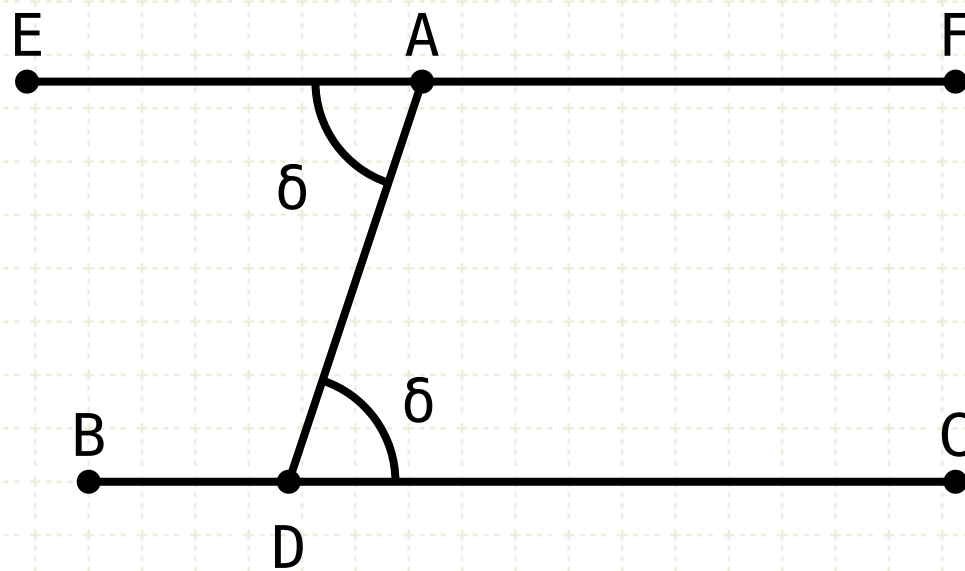
Extend line EA to AF

Line EF is parallel to BC

Proposition 31 of Book I

To draw a straight line through a given point parallel to a given straight line.

$$EF \parallel BC$$
$$\angle EAD = \angle ADC$$



Construction

Start with line BC and point A not on line BC

Define a point D on the line BC, and create line AD

Copy angle ADC on line AD at point A (I·23)

Extend line EA to AF

Line EF is parallel to BC

Proof

Angles EAD and ADC are equal and opposite angles, therefore lines EF and BC are parallel (I·27)

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