

Euclid's Elements

Book I

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

Albert Einstein

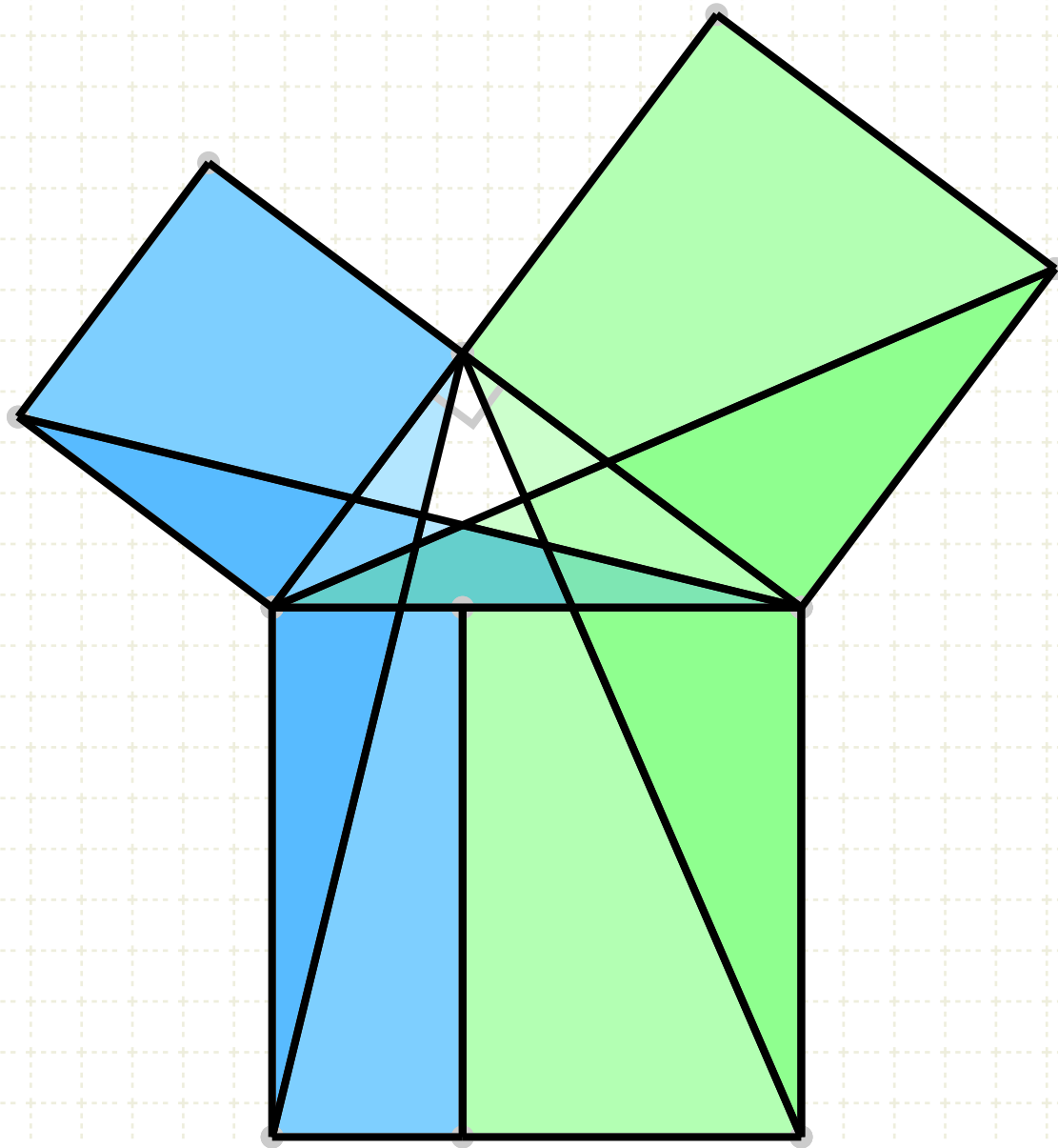


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Proposition 41 of Book I

If a parallelogram has the same base with a triangle and is in the same parallels, then the parallelogram is double the triangle.



Proposition 41 of Book I

If a parallelogram has the same base with a triangle and is in the same parallels, then the parallelogram is double the triangle.

In other words

If a parallelogram and a triangle have the same base and height, the triangle will have half the area of the parallelogram



Proposition 41 of Book I

If a parallelogram has the same base with a triangle and is in the same parallels, then the parallelogram is double the triangle.

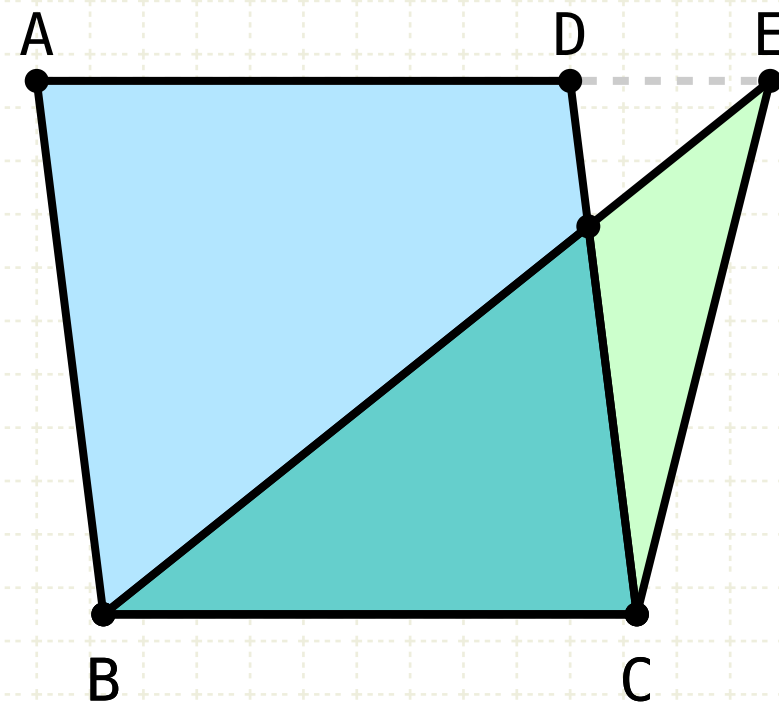
In other words

Given two parallel lines



Proposition 41 of Book I

If a parallelogram has the same base with a triangle and is in the same parallels, then the parallelogram is double the triangle.



$AE \parallel BC$

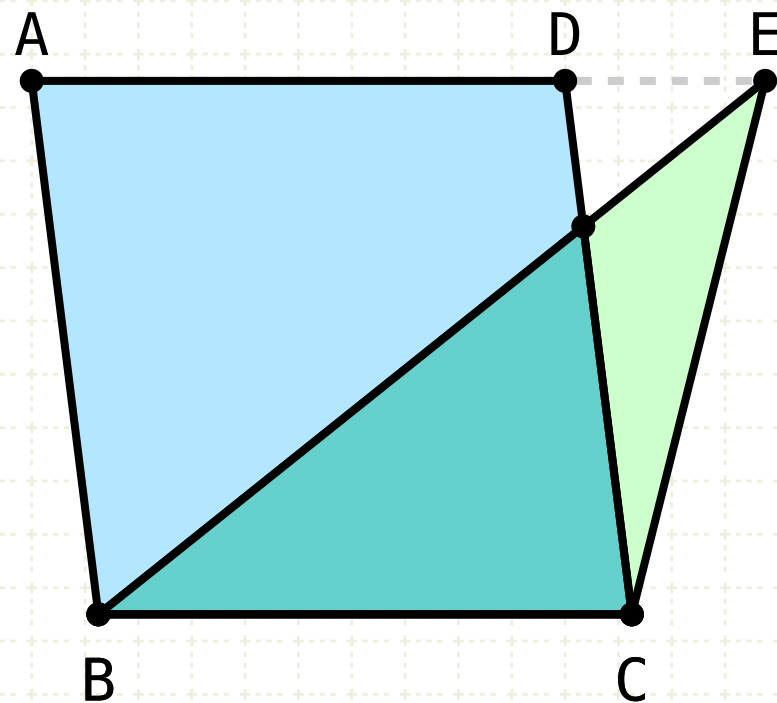
In other words

Given two parallel lines

Let the parallelogram ABCD and the triangle EBC have the same bases, and be on the same parallels

Proposition 41 of Book I

If a parallelogram has the same base with a triangle and is in the same parallels, then the parallelogram is double the triangle.



$$AE \parallel BC$$
$$EBC = \frac{1}{2} ABCD$$

In other words

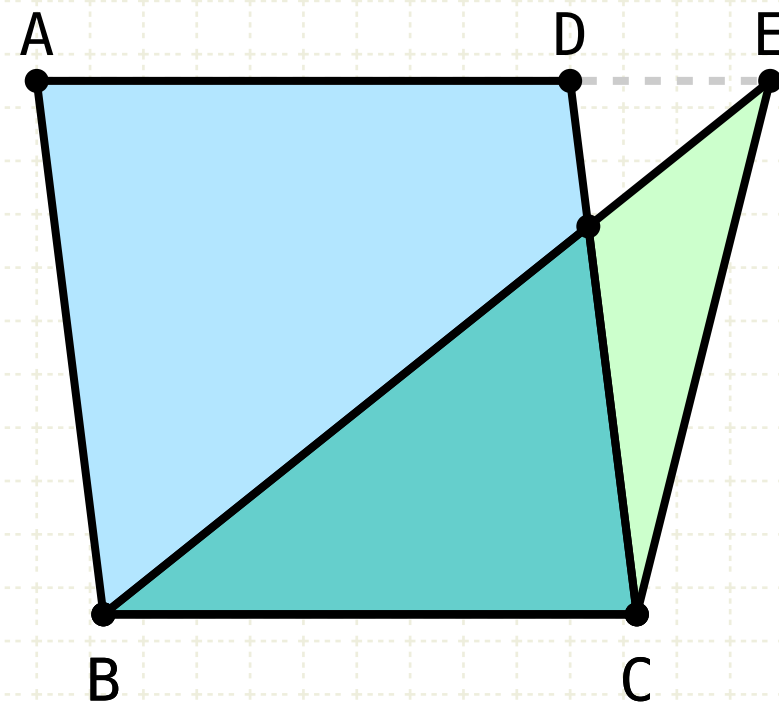
Given two parallel lines

Let the parallelogram ABCD and the triangle EBC have the same bases, and be on the same parallels

Then the area of the triangle EBC is half the area of the parallelogram ABCD

Proposition 41 of Book I

If a parallelogram has the same base with a triangle and is in the same parallels, then the parallelogram is double the triangle.



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In other words

Given two parallel lines

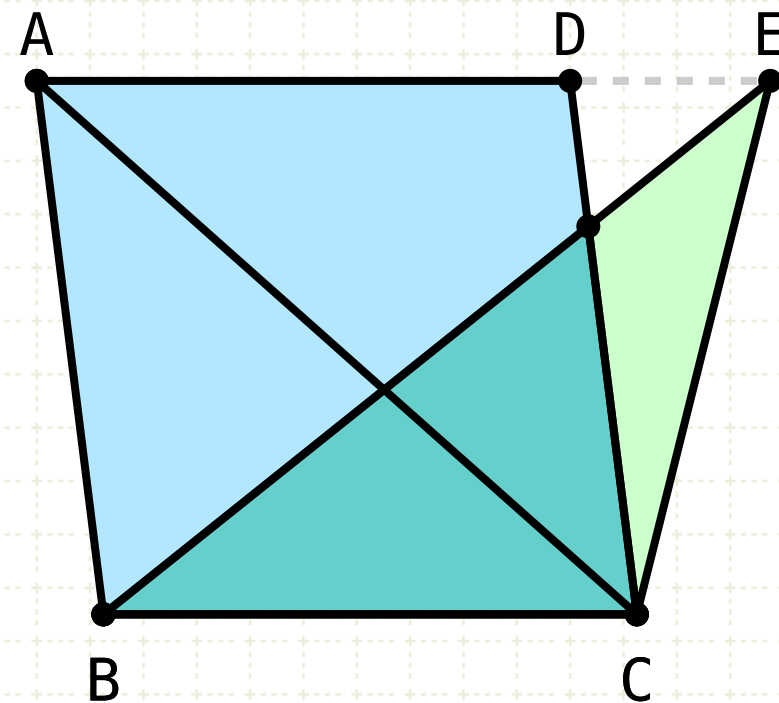
Let the parallelogram ABCD and the triangle EBC have the same bases, and be on the same parallels

Then the area of the triangle EBC is half the area of the parallelogram ABCD

Proof

Proposition 41 of Book I

If a parallelogram has the same base with a triangle and is in the same parallels, then the parallelogram is double the triangle.



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Let the parallelogram ABCD and the triangle EBC have the same bases, and be on the same parallels

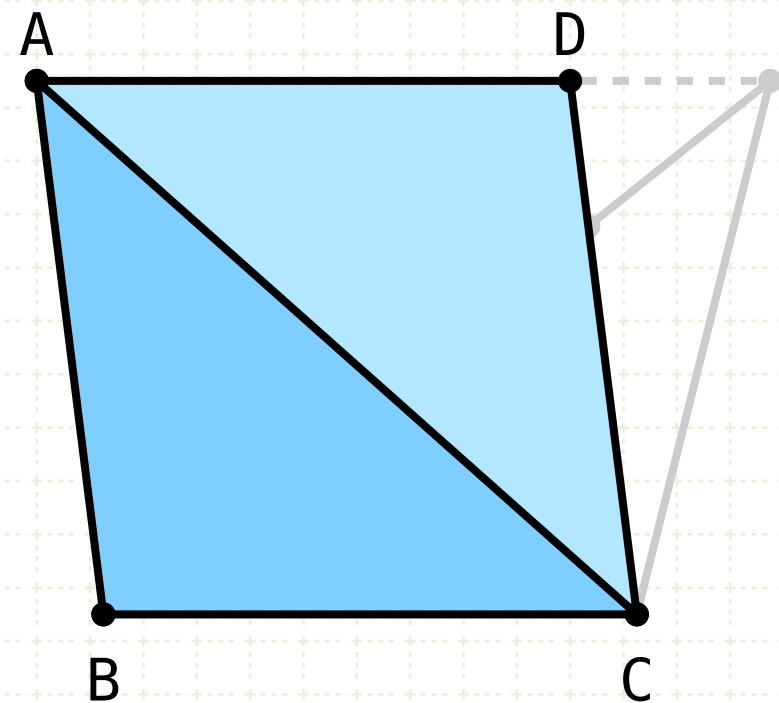
Then the area of the triangle EBC is half the area of the parallelogram ABCD

Proof

Draw the line AC

Proposition 41 of Book I

If a parallelogram has the same base with a triangle and is in the same parallels, then the parallelogram is double the triangle.



$$AE \parallel BC$$
$$\Delta ABC = \frac{1}{2} ABCD$$

In other words

Given two parallel lines

Let the parallelogram ABCD and the triangle EBC have the same bases, and be on the same parallels

Then the area of the triangle EBC is half the area of the parallelogram ABCD

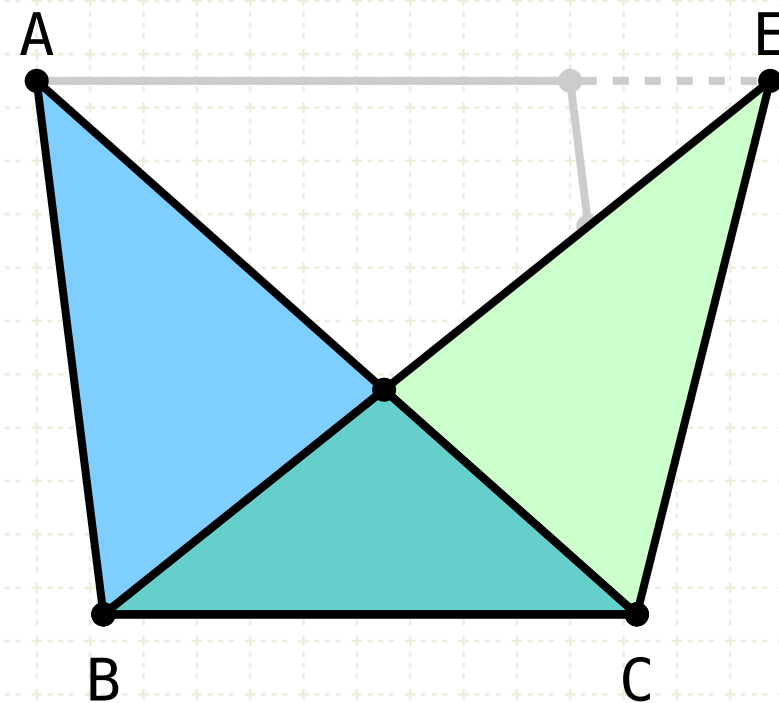
Proof

Draw the line AC

Triangle ABC is equal to one half of ABCD (I-34)

Proposition 41 of Book I

If a parallelogram has the same base with a triangle and is in the same parallels, then the parallelogram is double the triangle.



$$\begin{aligned} AE &\parallel BC \\ \Delta ABC &= \frac{1}{2} ABCD \\ \Delta ABC &= \Delta EBC \end{aligned}$$

In other words

Given two parallel lines

Let the parallelogram ABCD and the triangle EBC have the same bases, and be on the same parallels

Then the area of the triangle EBC is half the area of the parallelogram ABCD

Proof

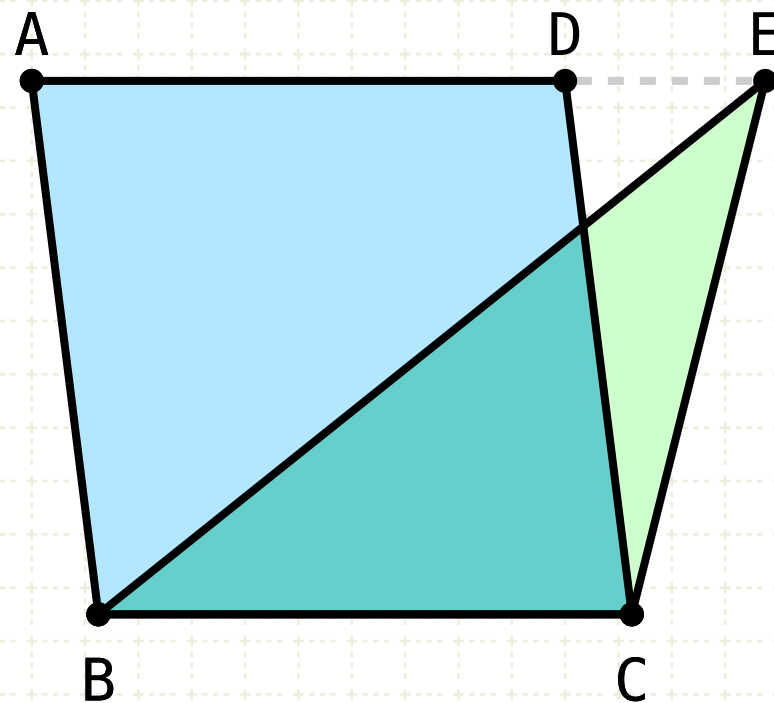
Draw the line AC

Triangle ABC is equal to one half of ABCD (I-34)

Triangles ABC and EBC are equal, since they are on the same parallels (I-37)

Proposition 41 of Book I

If a parallelogram has the same base with a triangle and is in the same parallels, then the parallelogram is double the triangle.



$AE \parallel BC$

$$\triangle ABC = \frac{1}{2} ABCD$$

$$\triangle ABC = \triangle EBC$$

$$\triangle EBC = \frac{1}{2} ABCD$$

In other words

Given two parallel lines

Let the parallelogram ABCD and the triangle EBC have the same bases, and be on the same parallels

Then the area of the triangle EBC is half the area of the parallelogram ABCD

Proof

Draw the line AC

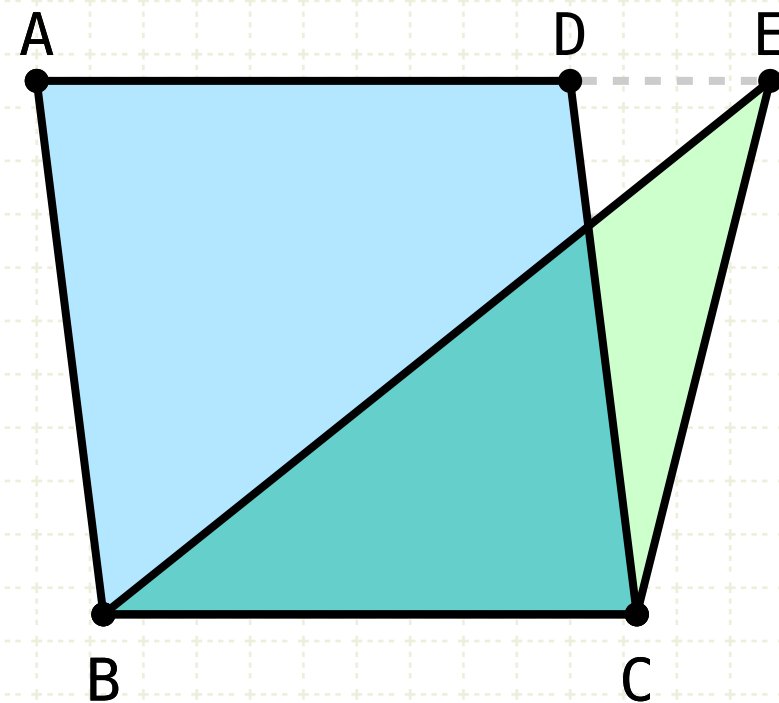
Triangle ABC is equal to one half of ABCD (I·34)

Triangles ABC and EBC are equal, since they are on the same parallels (I·37)

Thus triangle EBC is half the parallelogram ABCD

Proposition 41 of Book I

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$AE \parallel BC$

$$\triangle ABC = \frac{1}{2} ABCD$$

$$\triangle ABC = \triangle EBC$$

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In other words

Given two parallel lines

Let the parallelogram ABCD and the triangle EBC have the same bases, and be on the same parallels

Then the area of the triangle EBC is half the area of the parallelogram ABCD

Proof

Draw the line AC

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