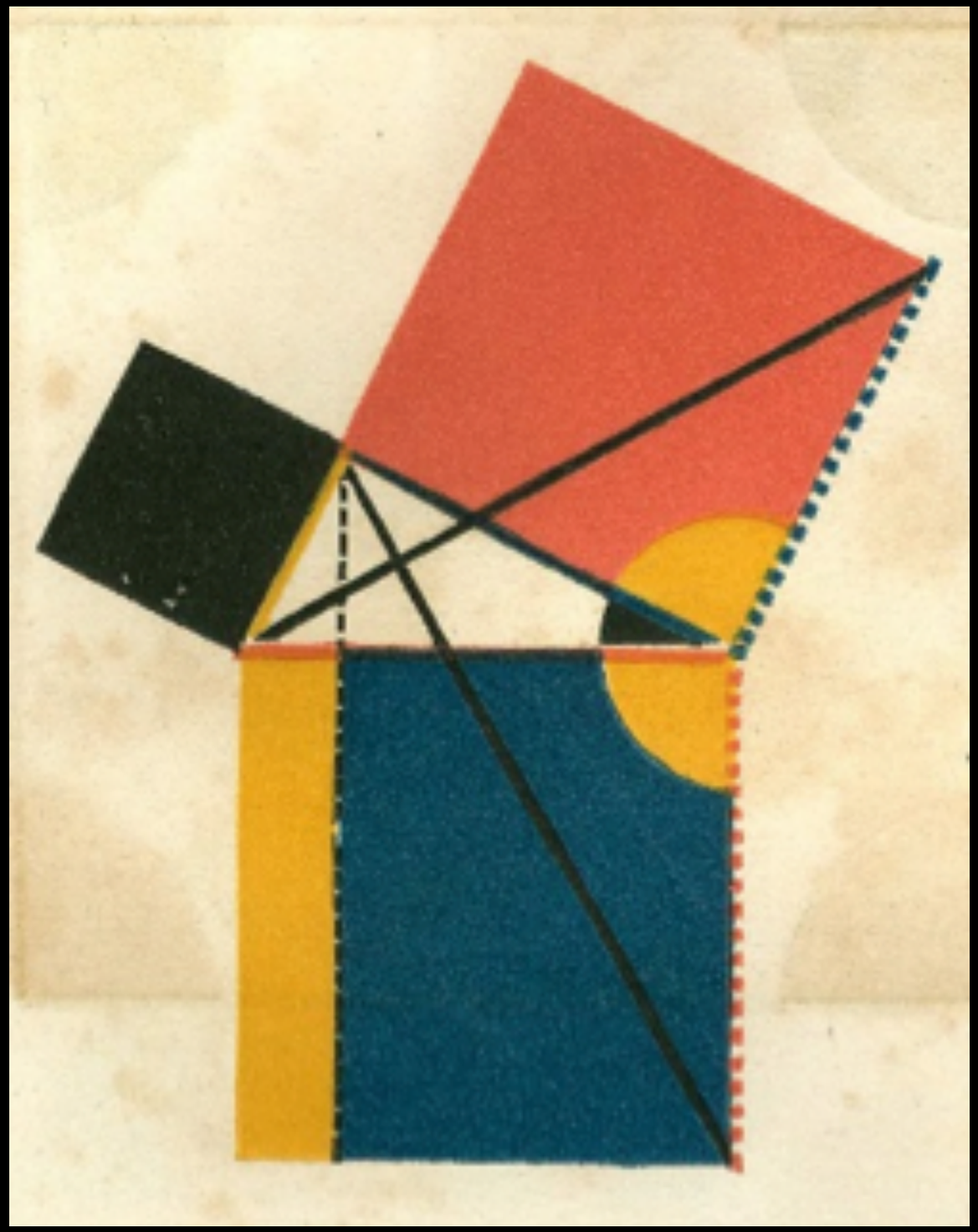
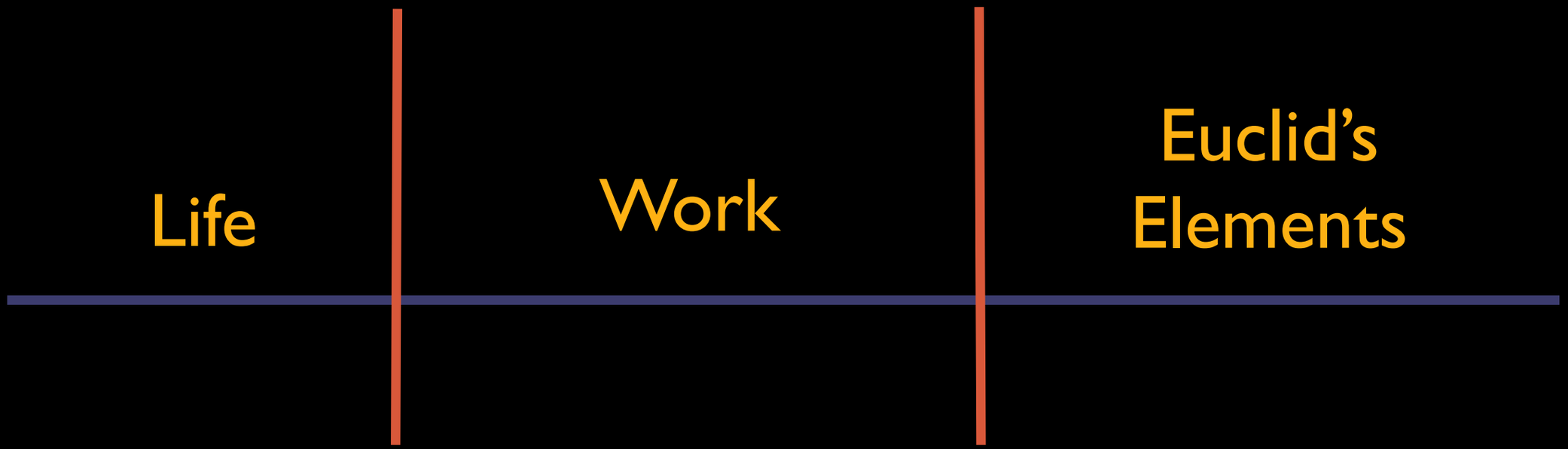
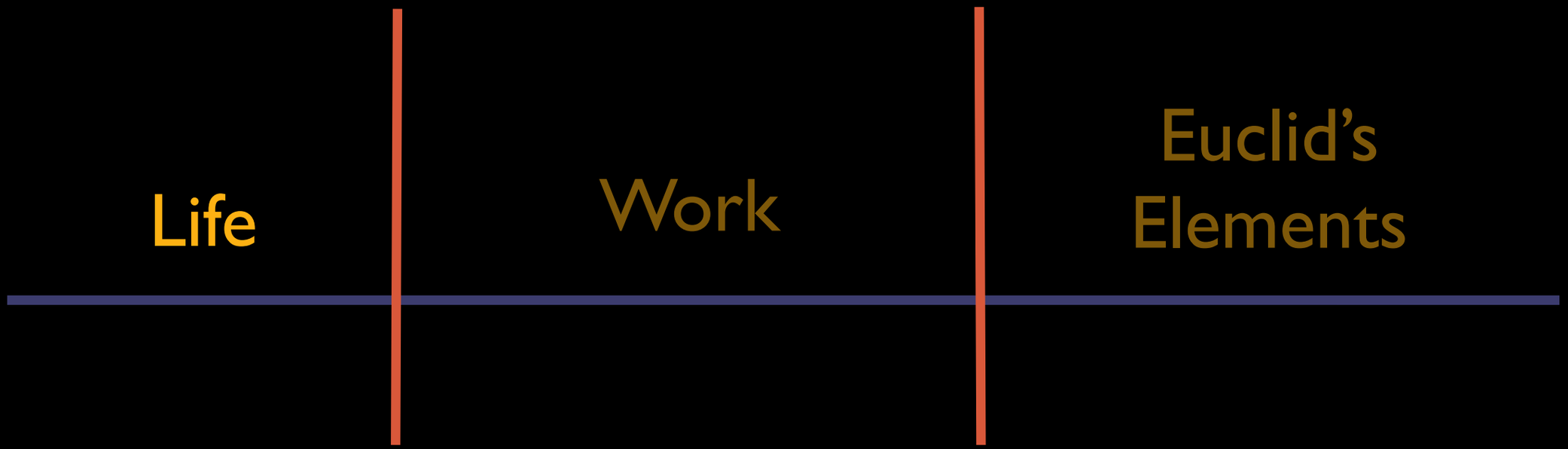


Oliver Byrne

“The Matisse of Mathematics”


Life
Work
Euclid's
Elements


Life
Work
Euclid's
Elements

Life

(1810 - 1880)

Mathematician

Educator

Author

Civil Engineer

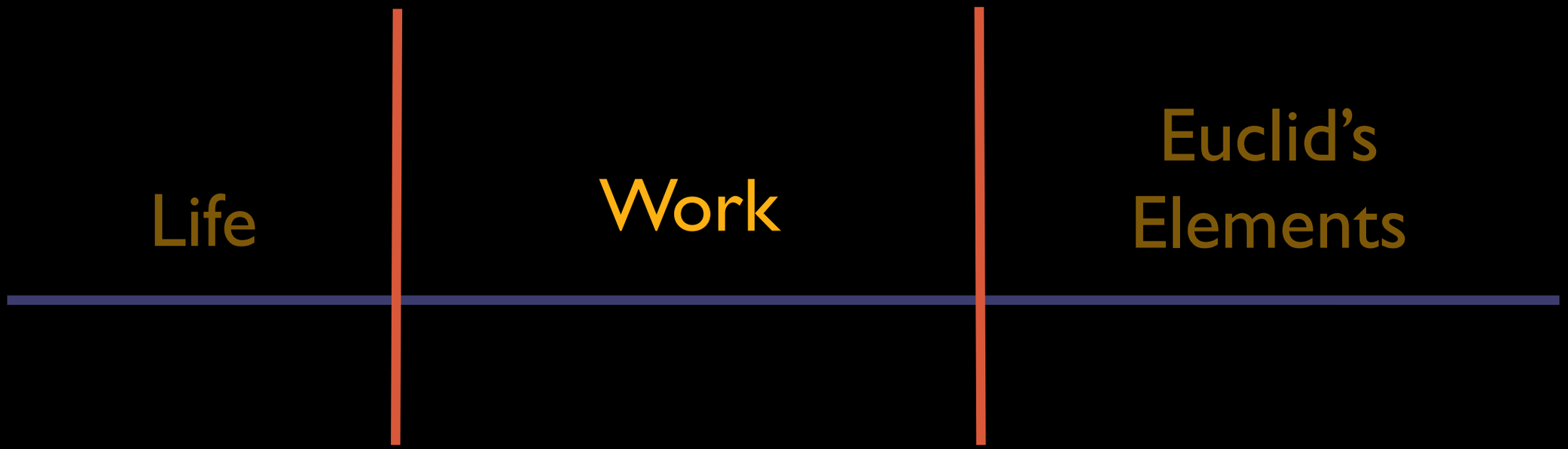
Activist

Professor

Inventor

Husband

(almost) Surveyor

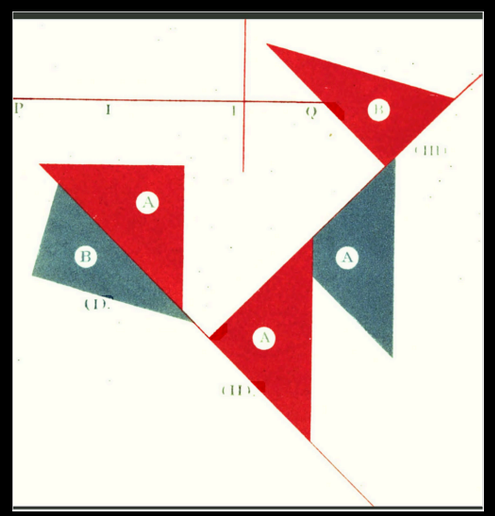

Life
Work
Euclid's
Elements

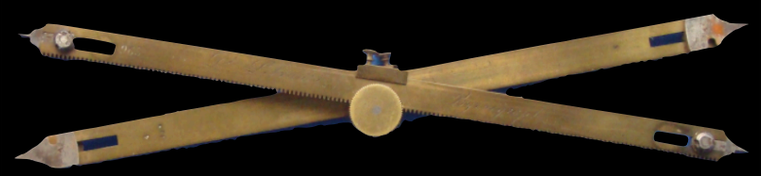
Work

THE MATHEMATICS OF A CREED.

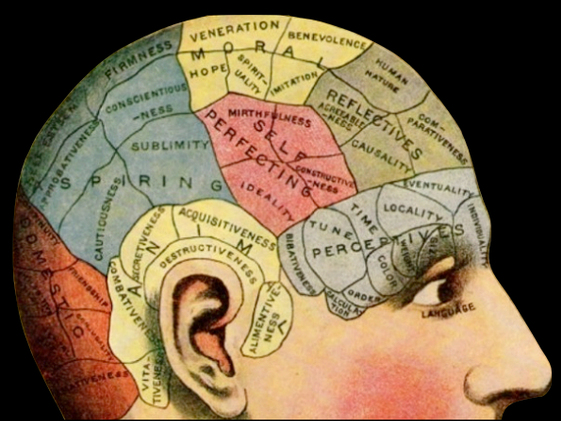
E. B. REVILO.

MEASURE THE EARTH
WITH THE ASSISTANCE
OF
RAILROADS.





IRISH FREEDOM.

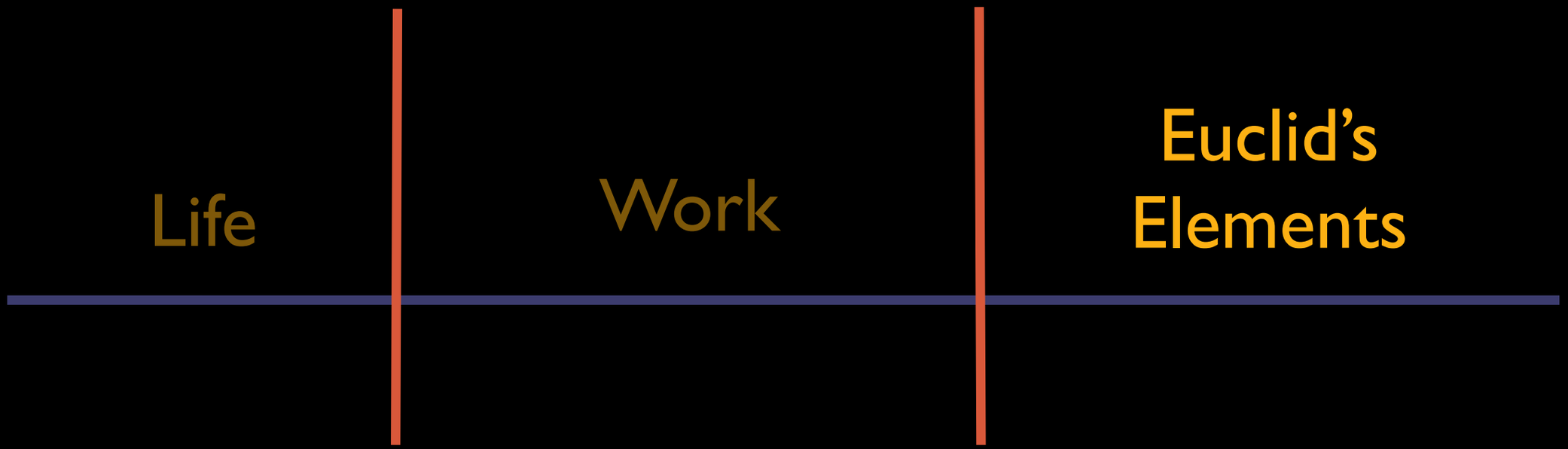


THE CALCULUS OF FORM.

FALLACIES

"I have met with nothing but difficulties and disappointments"

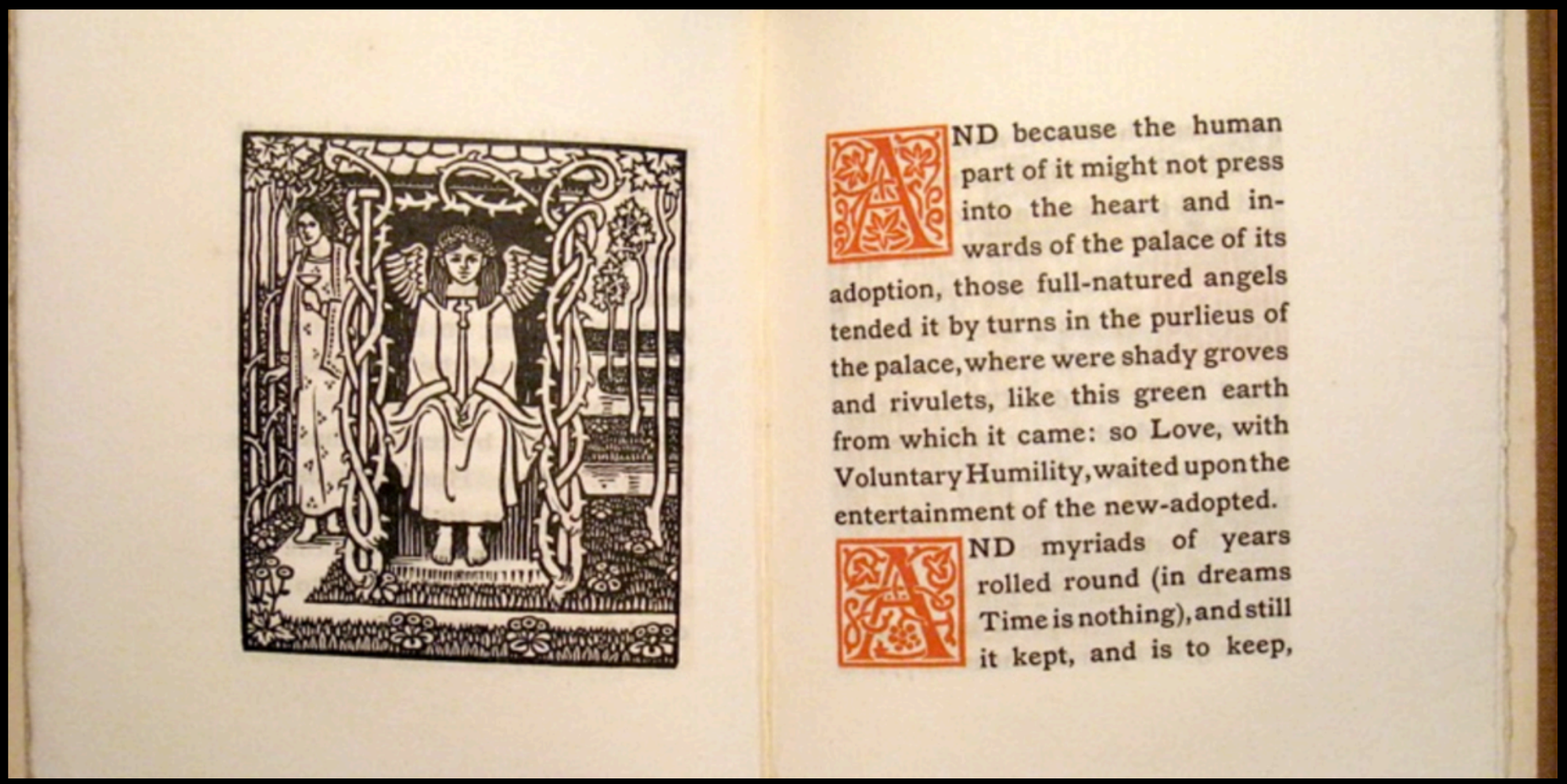
- Oliver Byrne in an Royal Literary Fund application
(27 November 1873)


Life
Work
Euclid's
Elements

Chiswick Press - 1847

Publisher:
William Pickering

Printer:
Charles Whittingham



AND because the human part of it might not press into the heart and inwards of the palace of its adoption, those full-natured angels tended it by turns in the purlieus of the palace, where were shady groves and rivulets, like this green earth from which it came: so Love, with Voluntary Humility, waited upon the entertainment of the new-adopted.

AND myriads of years rolled round (in dreams Time is nothing), and still it kept, and is to keep,

The Child Angel; A Dream by Charles Lamb, 1910

Euclid's Elements

INTRODUCTION.

THE arts and ſciences have become ſo extenſive, that to facilitate their acquirement is of as much importance as to extend their boundaries. Illuſtration, if it does not ſhorten the time of ſtudy, will at leaſt make it more agreeable. THIS WORK has a greater aim than mere illuſtration; we do not introduce colours for the purpoſe of entertainment, or to amuſe *by certain combinations of tint and form*, but to aſſiſt the mind in its reſearches after truth, to increaſe the facilities of inſtruction, and to diffuſe permanent knowledge. If we wanted authorities to prove the importance and uſefulneſs of geometry, we might quote every philoſopher ſince the days of Plato. Among the Greeks, in ancient, as in the ſchool of Peſtalozzi and others in recent times, geometry was adopted as the beſt gymnaſtic of the mind. In fact, Euclid's Elements have become, by common conſent, the baſis of mathematical ſcience all over the civilized globe. But this will not appear extraordinary, if we conſider that this ſublime ſcience is not only better calculated than any other to call forth the ſpirit of inquiry, to elevate the mind, and to ſtrengthen the reaſoning faculties, but alſo it forms the beſt introduction to moſt of the uſeful and important vocations of human life. Arithmetic, land-ſurveying, menſuration, engineering, navigation, mechanics, hydroſtatics, pneumatics, optics, phyſical aſtronomy, &c. are all dependent on the propoſitions of geometry.

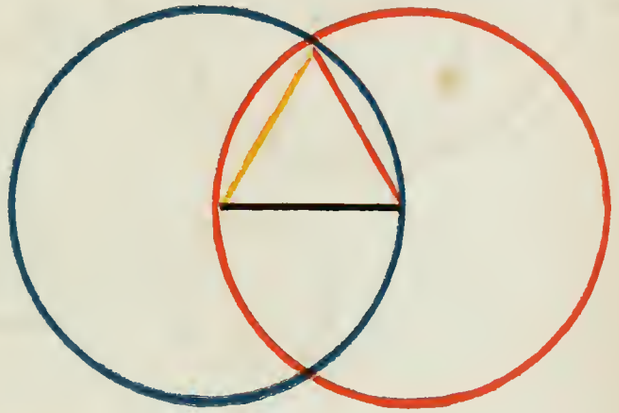
THIS WORK
has a greater aim than mere illuſtration; we do not introduce colours for the purpoſe of entertainment, or to amuſe *by certain combinations of tint and form*, but to aſſiſt the mind in its reſearches after truth, to increaſe the facilities of inſtruction, and to diffuſe permanent knowledge. If we

Euclid's Elements

Euclid.

BOOK I.

PROPOSITION I. PROBLEM.



ON *a given finite straight line* (——) *to deſcribe an equilateral triangle.*

Deſcribe ◯ and ◯ (poſtulate 3.); draw —— and —— (poſt. 1.).

then will △ be equilateral.

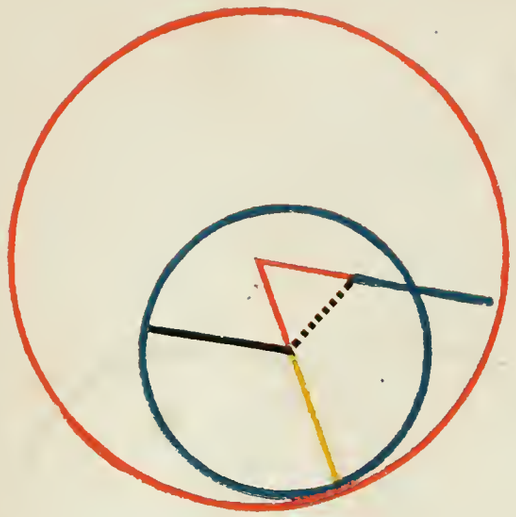
For —— = —— (def. 15.);

and —— = —— (def. 15.),

∴ —— = —— (axiom. 1.);

and therefore △ is the equilateral triangle required.

Q. E. D.



FROM *a given point* (—), *to draw a ſtraight line equal to a given finite ſtraight line* (———).

Draw ---------- (poſt. 1.), deſcribe △ (pr. 1.), produce —— (poſt. 2.), deſcribe ◯ (poſt. 3.), and

(poſt. 3.); produce —— (poſt. 2.), then —— is the line required.

For —— = —— (def. 15.), and —— = —— (conſt.), ∴ —— = —— (ax. 3.), but (def. 15.) ——— = —— = ——; ∴ —— drawn from the given point (——), is equal the given line ———.

Q. E. D.

Pythagorean Theorem Proof

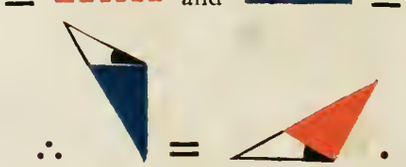
IN *a right angled triangle*  *the ſquare on the hypotenuſe* ——— *is equal to the ſum of the ſquares of the ſides,* (——— *and* ———).

On ———, ——— and ——— deſcribe ſquares, (pr. 46.)

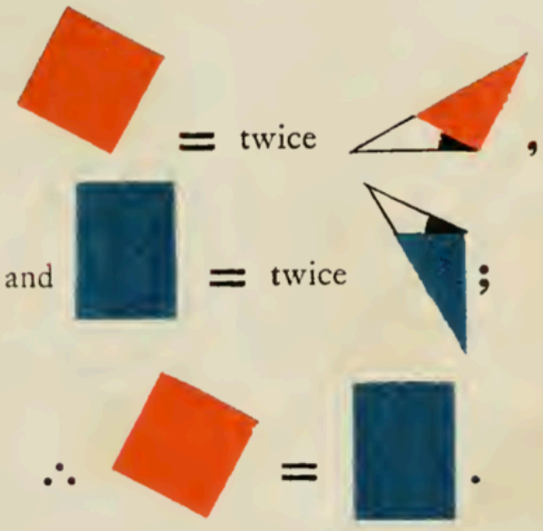
Draw ····· ‖ - - - - - (pr. 31.)
alſo draw ——— and ———.

To each add  ∴  ,

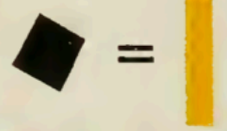
——— = - - - - - and ——— = ·····;



Again, becauſe ——— ‖ ———



In the ſame manner it may be ſhown

that  ;

hence  .

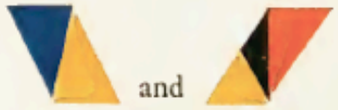
Q. E. D.

TRIANGLES  *and*

on the same base (——) *and between the same parallels are equal.*

Draw ------ || ——
------ || ——
} (pr. 31.)

Produce ----------.

 and are parallelograms on the same base, and between the same parallels, and therefore equal. (pr. 35.)

$\therefore$ {  = twice 
 = twice  } (pr. 34.)

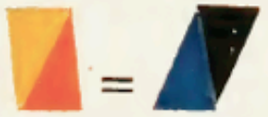
$\therefore$  =  .

Q. E D.

TRIANGLES 

( *and* ) *on equal bases and between the same parallels are equal.*

Draw ------ || ——
and ------ || ——
} (pr. 31.).

 = (pr. 36.);

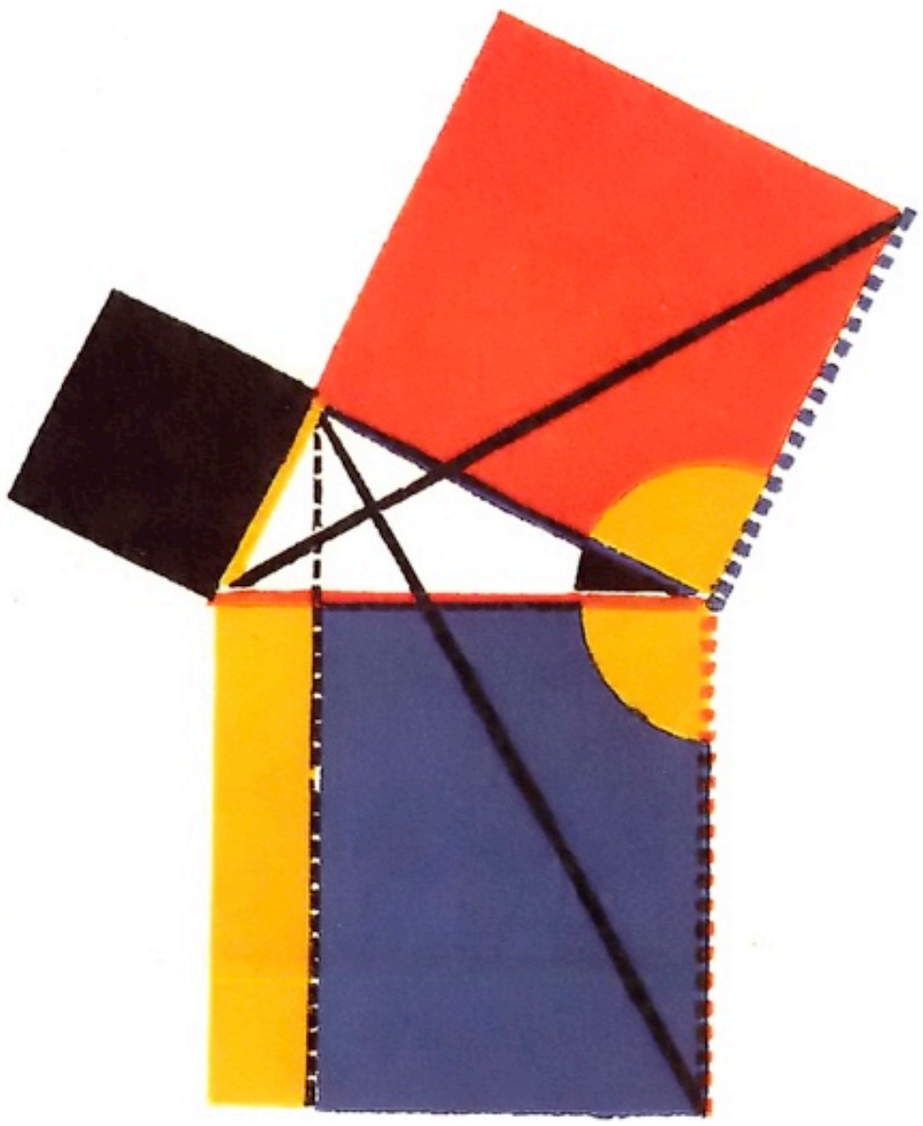
but  = twice  (pr. 34.),

and  = twice  (pr. 34.),

$\therefore$  =  (ax. 7.).

Q. E. D.

Euclid's Elements



IN *a right angled triangle*  *the ſquare on the hypotenuſe* —— *is equal to the ſum of the ſquares of the ſides,* (—— *and* ——).

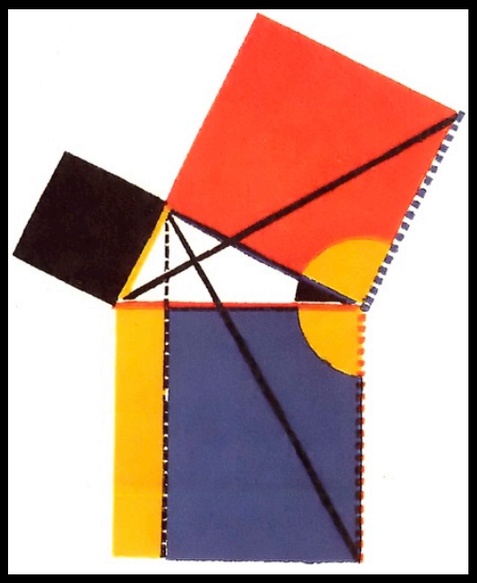
On ——, —— and ——

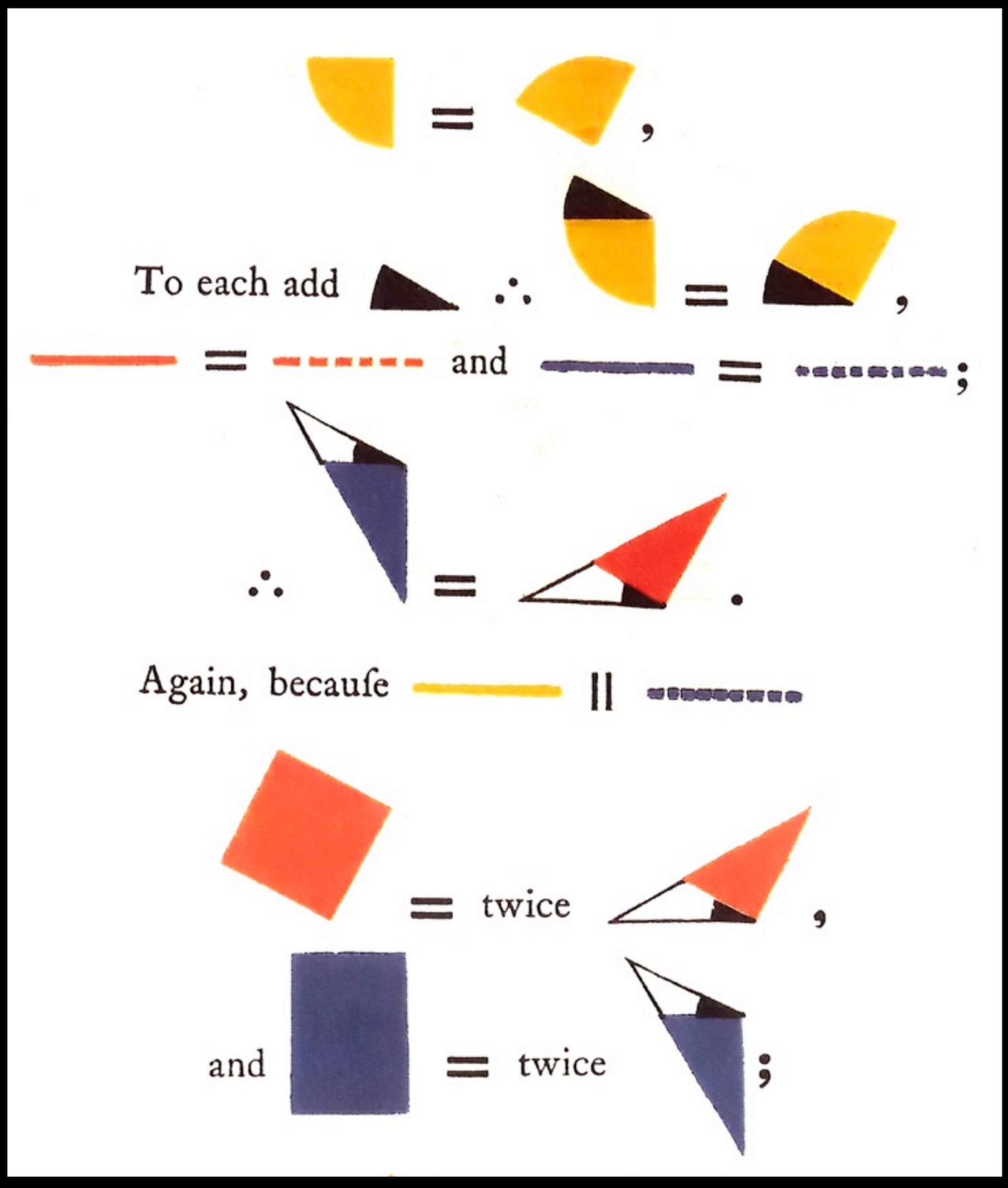
deſcribe ſquares, (pr. 46.)

Draw ---------- || - - - - - - (pr. 31.)

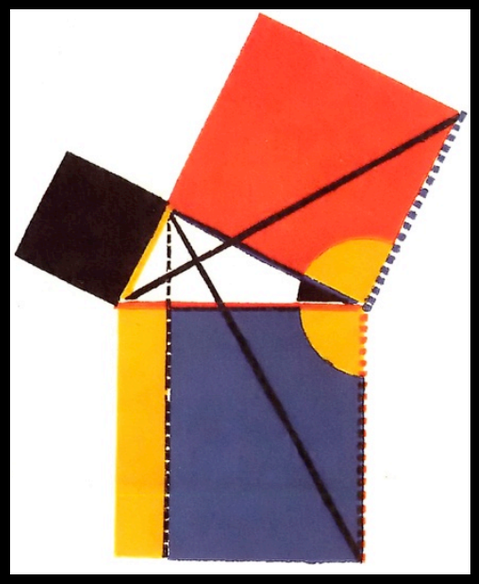
alſo draw —— and ——.

Euclid's Elements





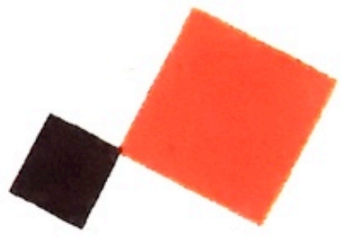
Euclid's Elements



∴  =  .

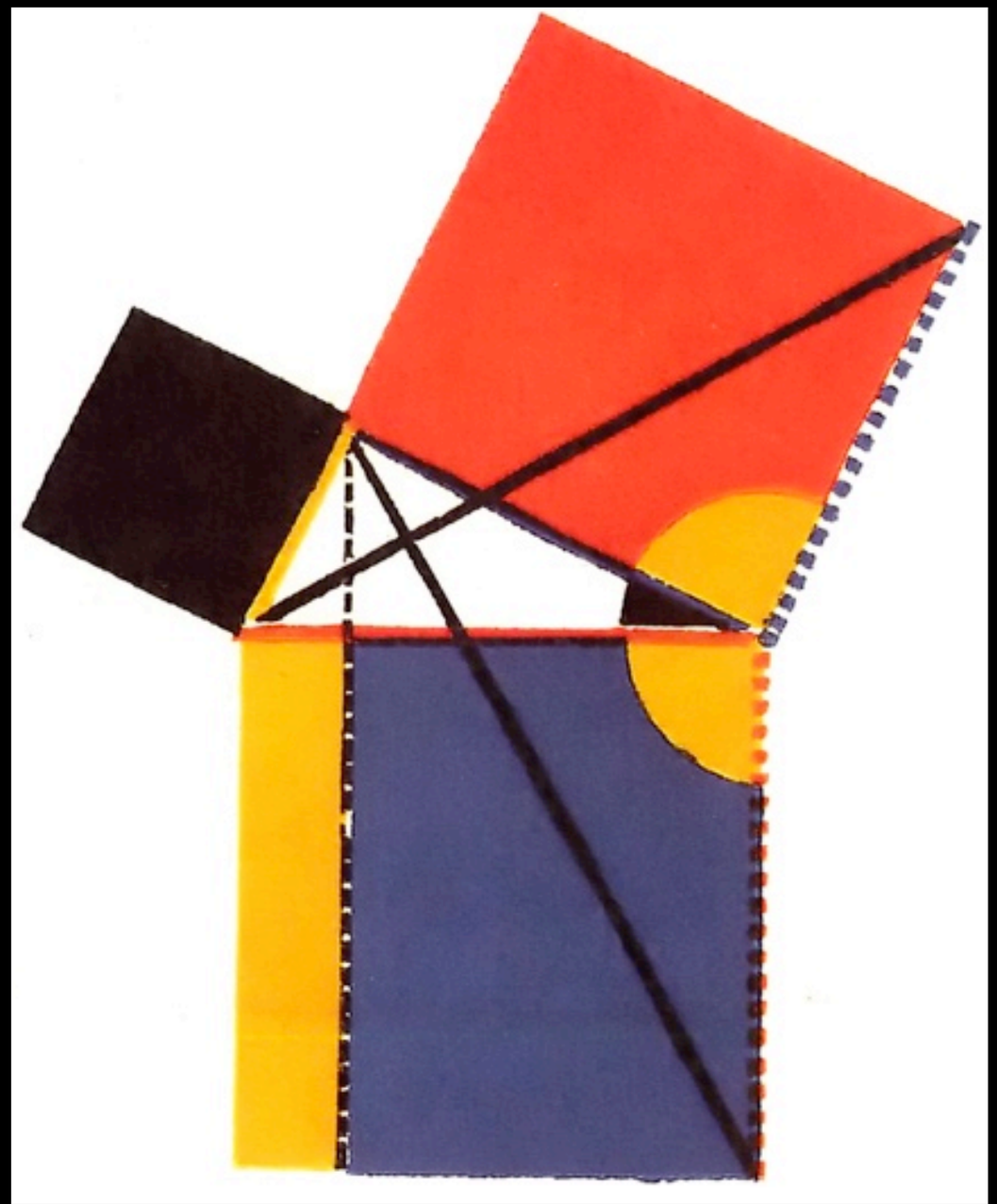
In the ſame manner it may be ſhown

that  =  ;

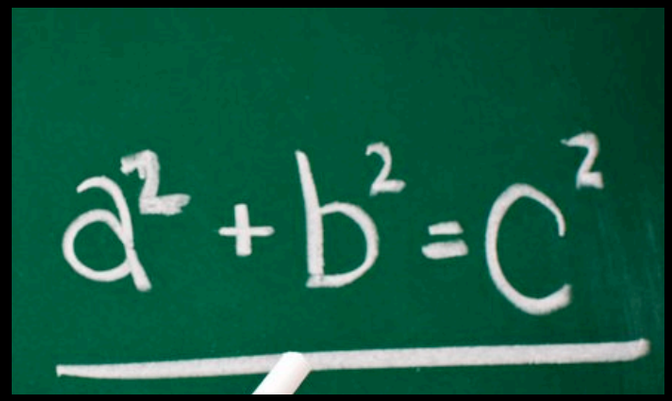
hence  =  .

Q. E. D.

Euclid's Elements



vs.



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