Study Note—Euclid's *Elements*, Book I, Proposition 17

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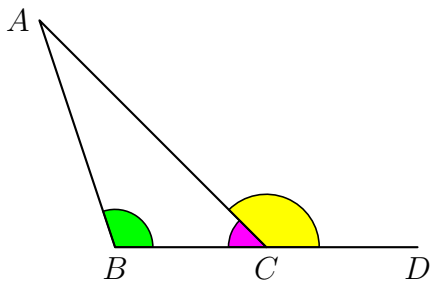
This proposition asserts that the sum of any two angles of a triangle is always less than two right angles.

To establish this proposition we show that, in a triangle ABC, the sum of the interior angles at the vertices B and C is less than two right angles. Let the side BC of the triangle be produced in a straight line beyond C to a point D.



It then follows from Proposition 16 of Book I of Euclid's *Elements of Geometry* that the exterior angle ACD at the vertex C (coloured yellow) is greater than the internal and opposite angle ABC at the vertex B (coloured green). Now the sum of the external angle ACD (coloured yellow) and the internal angle ACB (coloured magenta) at the vertex C is equal to two right angles (by Proposition 13 of Book I of Euclid's *Elements of Geometry*). Consequently the sum of the internal angles ABC and ACB of the triangle at the vertices B and C (coloured green and magenta respectively) is less than two right angles, as required.