Triple Cosines Theorem

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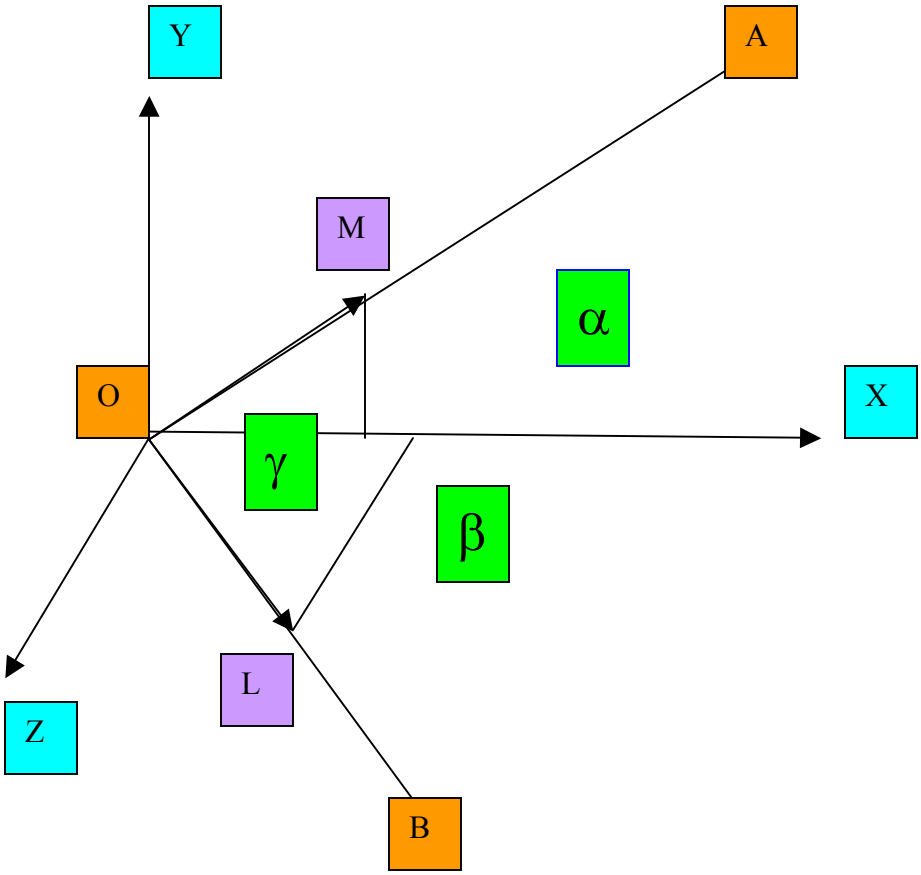

In a Cartesian coordinate system for a three-dimensional space of an ordered triplet of axes: **OX**, **OY, OZ** that go through the origin **O**, let the angle **AOX** = α,
the angle **XOB** = β.

Let us find the angle **AOB** = γ.

Solution. Let **OM** be a unit vector in the direction of **OA**, let **OL** be a unit vector in the direction of **OB**.

OM = (cos α, sin α, 0), **OL** = (cos β, 0, sin β)

Since the dot product of vectors **OM** and **OL** is:

OM * OL = |**OM**| |**OL**| cos γ = cos γ,

finally: cos γ = cos α cos β.