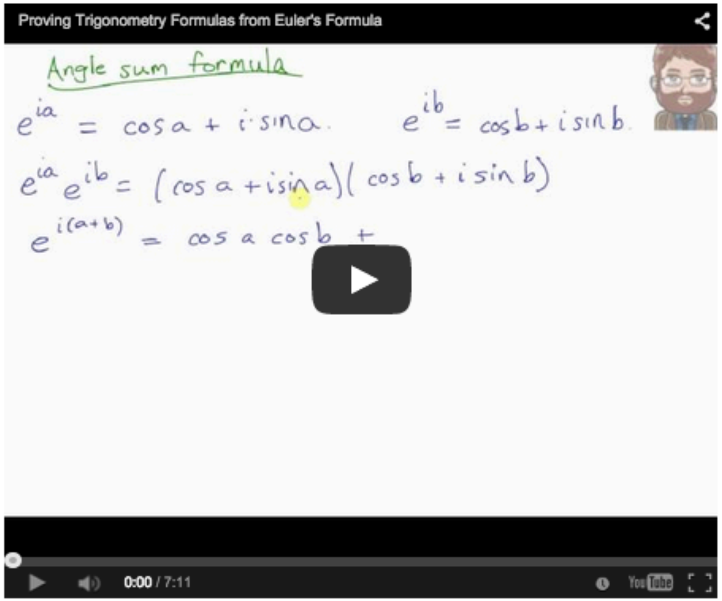
Proving Trigonometry Form × Hijung S.

video1



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Proving Trigonometric Formulas using Euler's Formula: $e^{ix} = \cos(x) + i\cdot\sin(x)$

We are going to prove some formulas from trigonometry, directly from Euler's formula, e^(ix) = cos(x)+isin(x).

$$\sin^2(x) + \cos^2(x) = 1$$

This can be proven from the Pythagorean theorem and the definitions of the trigonometric functions, but we are going to do it using Euler's formula.

$$e^{ix} = \cos x + i\cdot\sin x$$

First, use the fact that e^(ix), we know that's cos(x)+isin(x).

$$e^{-ix} = e^{i(-x)} = \cos(-x) + i\cdot\sin(-x) = \cos(x) - i\cdot\sin(x)$$

Next, we are going to multiply together these two equations right here.

$$e^{ix}\cdot e^{-ix} = (\cos x + i\cdot\sin x)(\cos x - i\sin x)$$

These exponents we will add them together, get zero for an exponent, and e^0 is 1.