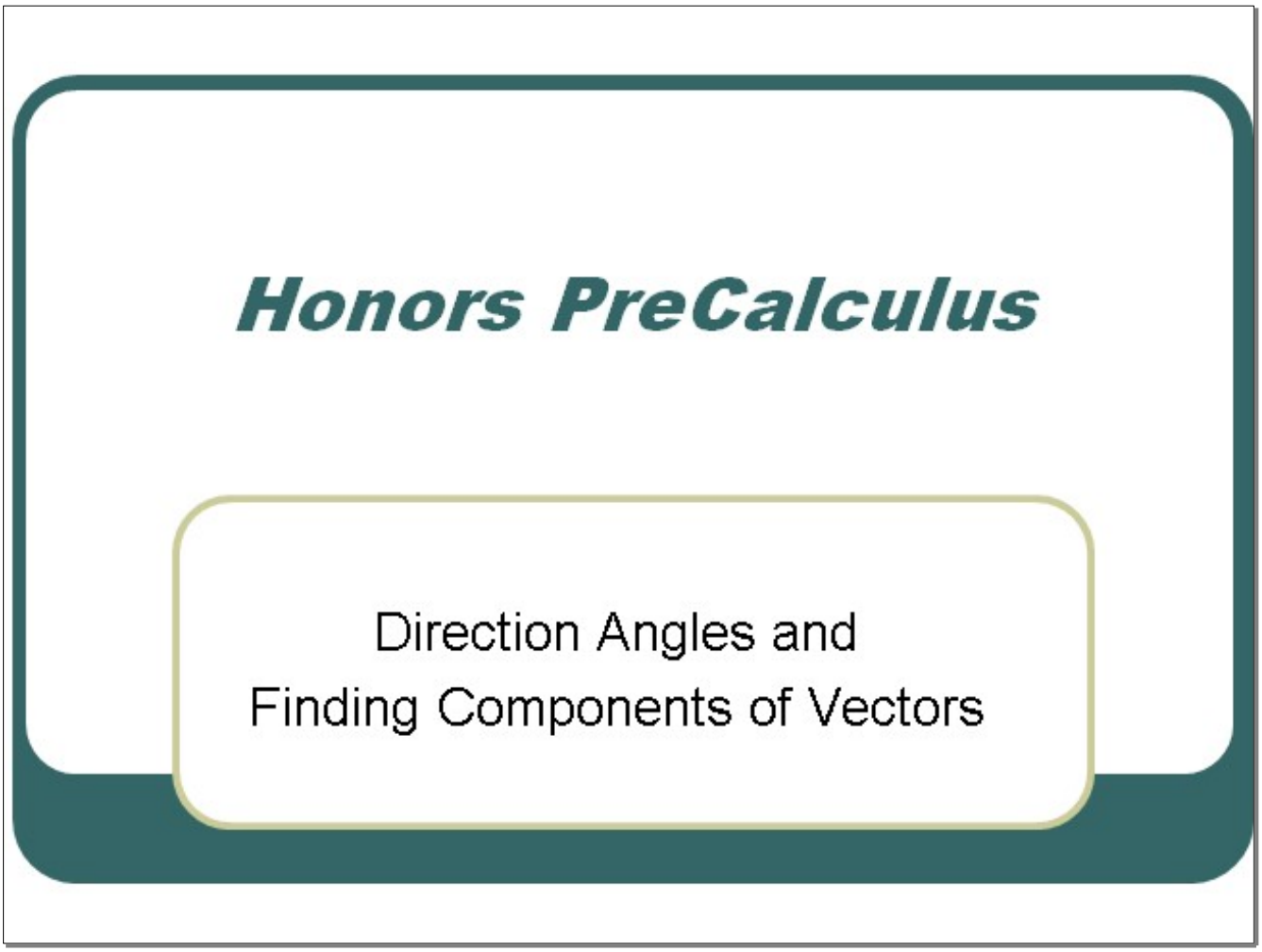

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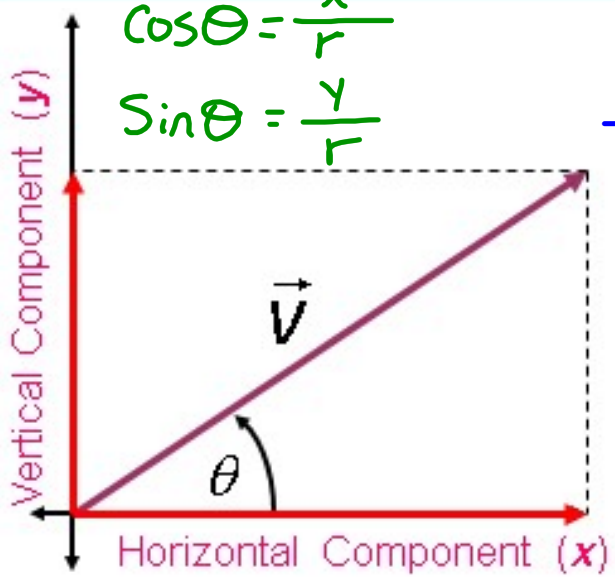
Direction Angle:

The angle that a vector makes with the positive x-axis (Counter-Clockwise)

$\cos\theta = \frac{x}{r}$

$\sin\theta = \frac{y}{r}$



Finding the components of a vector

a.k.a: "Resolving a vector into its components"

$\vec{v} = \langle \|v\|\cos\theta, \|v\|\sin\theta \rangle$

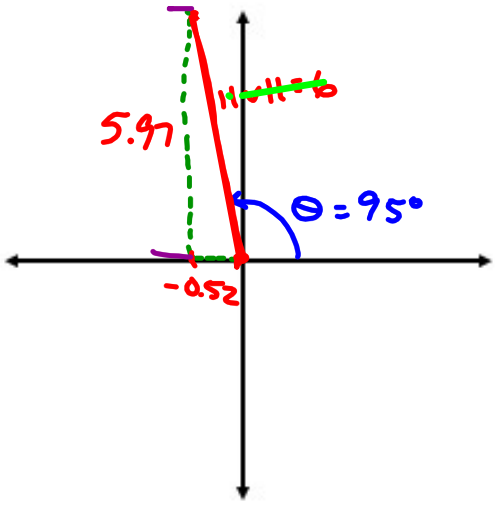
$\|v\|$ → magnitude

So: If you are given (or can find) the direction angle and the magnitude of a vector, the component form of the vector is:

Example 1: < >

Find the components of the vector with:

- Direction angle of 95°
- Magnitude of 6 → $||v|| = 6$



$\vec{v} = \langle x, y \rangle$

$\vec{v} = \langle 6\cos 95°, 6\sin 95° \rangle$

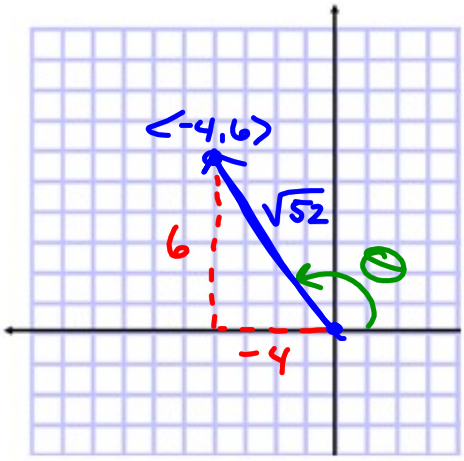
$= \langle -0.523, 5.977 \rangle$

Example 2:

Find the direction angle of the vector: θ

$\vec{v} = \langle -4, 6 \rangle$ Component form

Sketch the vector so that you know what quadrant it's in!!!!!!!



$\|\vec{v}\| = \sqrt{(-4)^2 + 6^2} = \sqrt{52}$

$16 + 36$

$\vec{v} = \langle |\vec{v}|\cos\theta, |\vec{v}|\sin\theta \rangle$

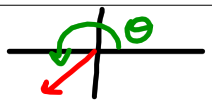
$\theta = \cos^{-1}\left(\frac{-4}{\sqrt{52}}\right)$ (x / r)

$\theta \approx 123.69°$

Example 3:

Find the direction angle of the vector:

$\vec{v} = \langle 7, -4 \rangle$

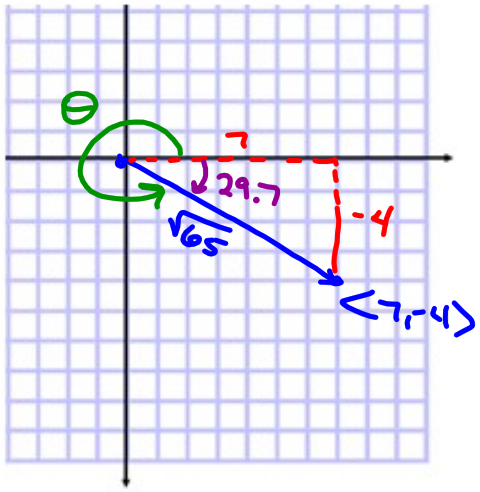


$\vec{v} = \langle \|v\|\cos\theta, \|v\|\sin\theta \rangle$

Sketch the vector so that you know what quadrant it's in!!!!!!!

$|\vec{v}| = \sqrt{7^2 + (-4)^2} = \sqrt{65}$

$49 + 16$



$\theta = \cos^{-1}\left(\frac{7}{\sqrt{65}}\right) \approx 29.7°$

$\theta = 360 - 29.7 \approx 330.3°$

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