

NAME:

PID:

MATH 20C, SECTION A08

October 14, 2014

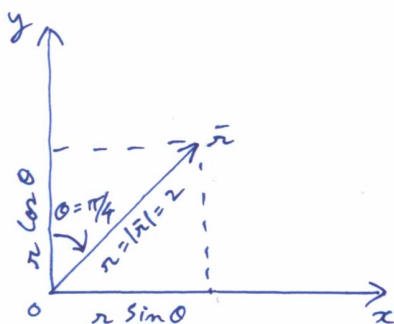
Quiz 1

1. (10 points) Find a vector in the plane of length 2 that makes an angle of $\frac{\pi}{4}$ with the y-axis.

Solution

Let \vec{r} be the required vector.

Given: $|\vec{r}| = r = 2$ and $\theta = \frac{\pi}{4}$



From the fig. above, the vector can be represented as follows:

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

$$\Rightarrow \vec{r} = \left\langle 2 \sin \frac{\pi}{4}, 2 \cos \frac{\pi}{4} \right\rangle$$

$$\Rightarrow \vec{r} = \left\langle 2 \left(\frac{1}{\sqrt{2}} \right), 2 \left(\frac{1}{\sqrt{2}} \right) \right\rangle$$

$$\Rightarrow \vec{r} = \langle \sqrt{2}, \sqrt{2} \rangle$$