232 Quiz 3   Name: _____ ✳ Key ✳ _____

February 3, 2012

Work individually. You may use your Notebooks.

For each problem you must use the unit circle provided and explain your work clearly to justify your answers.

1. (like number 20(b) from 6.1) Make a geometric argument that if $\theta = \frac{\pi}{5}$, then the tangent of θ is less than 1.

7 pts

$\pi/5$ is at (x,y)

$x, y \geq 0$

$x > y$ since $0 \leq \frac{\pi}{5} \leq \frac{\pi}{4}$

so $\tan \theta = \frac{y}{x} \not\leq 1$.

2. (like number 68 from 6.1) If θ is an angle with $\cos \theta = -\frac{1}{4}$, then what are the possible values of $\sin \theta$?

7 pts

$\sqrt{1^2 - (\frac{1}{4})^2}$

$= \sqrt{1^2 - \frac{1}{16}}$

$= \sqrt{\frac{15}{16}} = \frac{\sqrt{15}}{4}$

possible sines are

$\boxed{\pm \sqrt{15}/4}$

$\sqrt{1^2 - \frac{1}{4}^2}$

$\frac{1}{4}$

3. (like number 22 from 6.2) Make a geometric argument that $\sin(-\theta) = -\sin(\theta)$ for any angle θ.

7 pts

negatives of each other

$\sin \theta \longrightarrow$

$\sin -\theta \longrightarrow$

If θ "ends" at (a, b) then $-\theta$ "ends at $(a, -b)$

So $\sin(-\theta) = -\sin \theta$.