Name SOLUTIONS

- No calculators allowed.
- Show sufficient work to justify each answer.
- You have 15 minutes for this quiz.

1. (2 points) Is the following function even, odd or neither?

$$g(x) = \left(3x^2 + \cos^5 x\right)^7$$

$g(-x) = (3(-x)^2 + \cos^5(-x))^7$

$= (3x^2 + \cos^5(x))^7$ since cosine is even

$= g(x)$

g is even

2. (2 points) What is the domain of the function $f(x) = \sqrt{5 - \sqrt{2x-1}}$?

$2x - 1 \geq 0$ and $5 - \sqrt{2x-1} \geq 0$

$2x \geq 1$ $\quad 5 \geq \sqrt{2x-1}$

$x \geq 1/2$ $\quad 25 \geq 2x - 1$

$26 \geq 2x$

$13 \geq x$

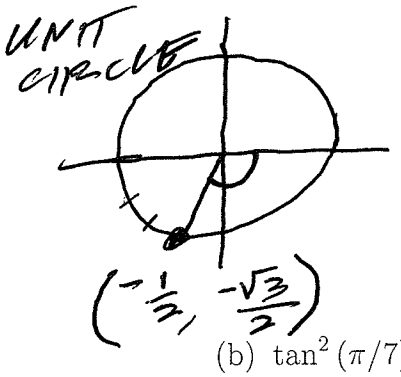
$x \geq 1/2$ and $x \leq 13$

$[\frac{1}{2}, 13]$

3. (2 points each) Evaluate the following quantities.

(a) $\cot(-2\pi/3)$ $= \dfrac{\cos(-2\pi/3)}{\sin(-2\pi/3)} = \dfrac{-1/2}{-\sqrt{3}/2}$

$= \dfrac{1}{\sqrt{3}}$ or $\dfrac{\sqrt{3}}{3}$



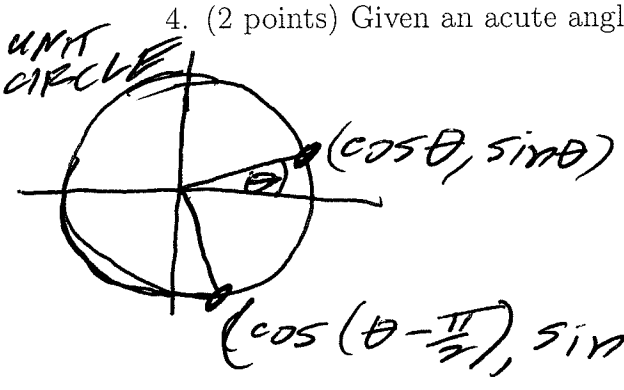
(b) $\tan^2(\pi/7) - \sec^2(\pi/7)$ $= \tan^2(\frac{\pi}{7}) - (\tan^2(\frac{\pi}{7}) + 1)$

$= -1$

we used the identity

$\tan^2\theta + 1 = \sec^2\theta$

4. (2 points) Given an acute angle θ for which $\sin\theta = 4/5$, evaluate $\sin(\theta - \pi/2)$.



GEOMETRICALLY we see $\sin(\theta - \frac{\pi}{2}) = -\cos\theta$

(or use identity $\sin(x-y) = \sin x\cos y - \cos x \sin y$)

From $\sin^2\theta + \cos^2\theta = 1$ we get

$(\frac{4}{5})^2 + \cos^2\theta = 1 \Rightarrow \cos\theta = \pm 3/5$

θ is acute $\Rightarrow$ $\cos\theta = 3/5$

Now $\sin(\theta - \frac{\pi}{2}) = -\cos\theta$

$= -3/5$