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

\[ g(x) = (3x^2 + \cos^5 x)^7 \]

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

\[ = (3x^2 + \cos^5 (x))^7 \quad \text{since cosine is even} \]

\[ = g(x) \]

\[ g \text{ is even} \]

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

\[ 2x-1 \geq 0 \quad \text{and} \quad 5 - \sqrt{2x-1} \geq 0 \]

\[ 2x \geq 1 \]

\[ x \geq 1/2 \]

\[ x \geq 1/2 \text{ and } x \leq 13 \]

\[ [1/2, 13] \]
3. (2 points each) Evaluate the following quantities.

(a) \[ \cot(-2\pi/3) = \frac{\cos(-2\pi/3)}{\sin(-2\pi/3)} = \frac{-1/2}{-\sqrt{3}/2} = \frac{1}{\sqrt{3}} \text{ or } \frac{\sqrt{3}}{3} \]

(b) \[ \tan^2(\pi/7) - \sec^2(\pi/7) = \tan^2\left(\frac{\pi}{7}\right) - (\tan^2\left(\frac{\pi}{7}\right) + 1) = -1 \]

we used the identity \[ \tan^2\theta + 1 = \sec^2\theta \]

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

Geometrically, we see \[ \sin(\theta - \pi/2) = -\cos \theta \]

Or use identity \[ \sin(x-y) = \sin x \cos y - \cos x \sin y \]

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

\[ \left(\frac{4}{5}\right)^2 + \cos^2 \theta = 1 \Rightarrow \cos \theta = \pm \frac{3}{5} \]

\( \theta \) is acute \( \Rightarrow \cos \theta = \frac{3}{5} \)

Now \( \sin(\theta - \pi/2) = -\cos \theta = -\frac{3}{5} \)