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

\[ f(x) = \frac{8x^3}{x^4 + 5} \]

\[ f(-x) = \frac{8(-x)^3}{(-x)^4 + 5} \]

\[ = -\frac{8x^3}{x^4 + 5} \]

\[ = -f(x) \text{ so it's odd} \]

2. (2 points) What is the domain of the function \( f(x) = \sqrt{3 - \sqrt{x - 2}} \)?

\[ x - 2 \geq 0 \Rightarrow x \geq 2 \]

\[ 3 - \sqrt{x - 2} \geq 0 \Rightarrow 3 \geq \sqrt{x - 2} \Rightarrow 9 \geq x - 2 \Rightarrow 11 \geq x \]

So \( 2 \leq x \leq 11 \)

The domain of \( f \) is \([2, 11]\)

3. (1 point) Given that \( f(x) = x^2 + 1 \) and \( g(x) = 3x - 2 \), evaluate and simplify \( (g \circ f)(2) \).

\[ (g \circ f)(2) = g(f(2)) \]

\[ = g(5) \]

\[ = 13 \]
4. (1 point) Evaluate and simplify \( \sec \left( \frac{4\pi}{3} \right) \).

\[
\sec \left( \frac{4\pi}{3} \right) = \frac{1}{\cos \left( \frac{4\pi}{3} \right)} \\
= \frac{1}{-\frac{1}{2}} \\
= -2
\]

5. (2 point) Determine real numbers \( a \) and \( b \) so that the expression \( 5 \tan^2 \theta + 2 \sec^2 \theta \) can be rewritten as \( a \sec^2 \theta + b \).

\[
5 \tan^2 \theta + 2 \sec^2 \theta = 5 (\sec^2 \theta - 1) + 2 \sec^2 \theta \\
= 7 \sec^2 \theta - 5
\]

So \( a = 7 \), \( b = -5 \).

6. (2 points) Carefully sketch a graph of the function \( f(x) = 5 - 2 \cos x \) on the interval \([0, 2\pi]\).