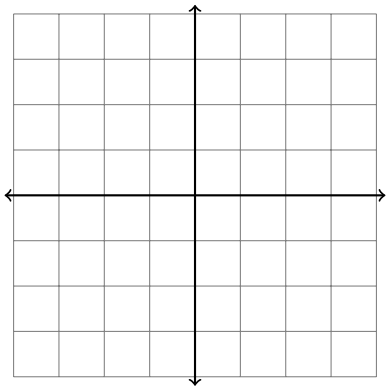
Skills Questions:

1. Evaluate $\arccos(\cos(3\pi))$.
2. Evaluate $\ln(e^2)$.
3. Find the derivative of $f(x) = e^{2x+3\sin x}$.
4. Find the derivative of $f(x) = \arctan(\sqrt{x})$.
5. Find $\lim_{x\to 0} \dfrac{\cos(x) - 1}{x^2}$.
6. Find the absolute maximum and minimum of the function $f(x) = 3x - x^3$ on the interval $[0, 2]$.
7. Let $f(x) = x^2 - 4x + 5$. State the intervals on which f is increasing and decreasing.
8. Using calculus, show that the graph of $y = \ln(x)$ is always concave down on its domain.
9. Using calculus, find the inflection points of the graph of $y = \cos(x)$ on the interval $[0, 2\pi]$.

Concept Questions:

8. Find dy/dx if $y^2 + \tan(xy) = \arcsin(x)$.

9. Draw an accurate graph of $y = \cos(\arccos(x))$. Be sure to specify the domain and range.



10. Explain why $f''(x) < 0$ indicates that the function f is concave down at x. Include one or more graphs to justify your explanation.

11. You are given a function $f(x)$. Below is the graph of its derivative, $f'(x)$. Sketch a graph of what the original function $f(x)$ might look like. The gray squares are one unit on each side. You may draw the function on either graph.