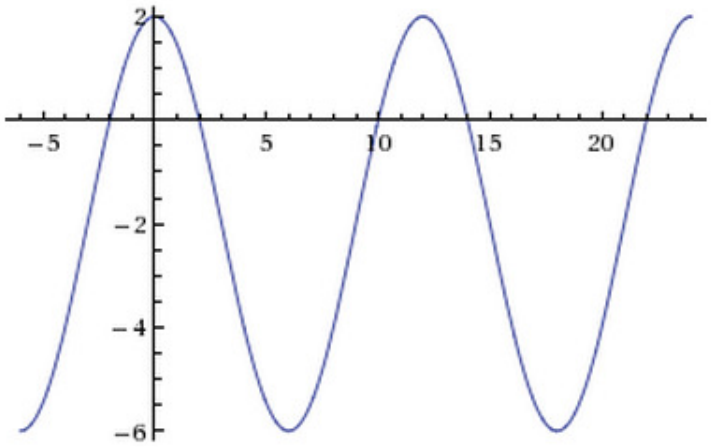
You will have at least 15 minutes to complete the quiz. No calculators.

1. [3 pts] The graph of a periodic function is given. Estimate its period, amplitude, and midline.



Period: 12

Ampltiude: 4

Midline: -2

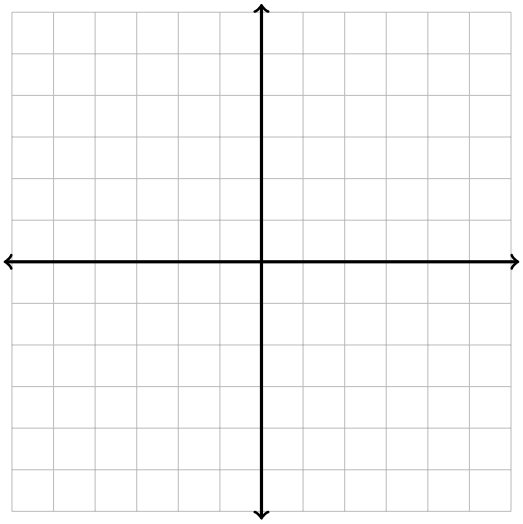
2. [5 pts] Let $g(t) = 20 \cdot e^{0.001(t-1)}$. Identify a parent function $p(t)$, write an equation describing $g(t)$ as a transformation of $p(t)$, and identify the transformations that give $g(t)$.

Parent: $p(t) = e^t$.
$g(t) = 20p(0.001(t-1))$
First stretch v. by 20, then stretch h. by 1000, then shift right 1.

3. [4 pts] Suppose $(3, 0)$ is a point on the graph of $f(t)$. Find a point on the graph of $\frac{1}{2}f(-\frac{1}{2}t) + 1$.
$(3, 0) \to (3, 0) \to (3, 1) \to (-6, 1)$.

4. [8 pts] Suppose that a function f is periodic with period 4, and moreover it is given by the equation $f(x) = \sqrt{x}$ for $0 \leq x < 4$.

(a) Sketch a graph of f as accurately as possible. Include at least three periods.



(b) Find $f(-2)$. (You do not need to give me a decimal answer.)
$f(-2) = f(2)$ (by periodicity), so $f(-2) = \sqrt{2}$.

(c) Compute $f(4)$.
By periodicity, $f(4) = f(0) = \sqrt{0} = 0$.

(d) Find <u>all</u> solutions to the equation $f(x) = 1$.
In the fundamental domain, we solve $\sqrt{x} = 1$. This gives $x = 1$, which is in the fundamental domain. All other solutions are $x = 1 + 4n$ for any whole number n.