Name:

For this entire exam, let $f(x) = x^2 + x + 1$ and $g(x) = \sqrt{4 + 2x}$.

1. Find $g(6)$, $(f \circ g)(0)$, $(g \circ f)(1)$, and the intersection points of f and g^2.

2. Show, using **the definition** of the limit, that $\lim\limits_{x \to 1} f(x) = 3$ and $\lim\limits_{x \to -2+} \frac{1}{g(x)} = \infty$.

3. Show, using the Intermediate Value Theorem, that f and g have an intersection point in the interval $(0, 1)$. Use the bisection method to determine an interval of length 0.125 in which this point lies.

4. Calculate $\lim\limits_{x \to 1} \frac{f(x) - f(1)}{x - 1}$ and $\lim\limits_{t \to 6} \frac{g(t) - g(6)}{t - 6}$.