Quiz 5

1. (5 points). Compute the limit $\lim\limits_{x\to\infty} \dfrac{x^2(1+\cos x)}{x^3+2}$ using the squeeze theorem.

2. (5 points). Compute the derivative of $f(x) = x^2 + 2$ at a using $\lim\limits_{h\to 0} \dfrac{f(a+h) - f(a)}{h}$.

3. (5 points). Prove $\lim\limits_{x\to 2}(x^2 + 2) = 6$ using the precise definition of the limit.

Extra credit. (2 points). With the domain $[-\frac{1}{2}, \infty)$, $f(x) = \sqrt{1 + x + x^2}$ is invertible. Find a formula for the inverse f^{-1}, as well as the domain and the range of the inverse.