Quiz 3

1. (5 points). Simplify $\sin(2\sec^{-1}(x))$ so that it no longer has trigonometric functions.

2. We define the function f by the following:

$$f(x) = \begin{cases} x & \text{if } x < 2 \\ x^2 + a & \text{if } x > 2. \end{cases}$$

(a) (2 points). What is $\lim_{x \to 2^-} f(x)$?

(b) (2 points). What is $\lim_{x \to 2^+} f(x)$?

(c) (2 points). For which a does $\lim_{x \to 2} f(x)$ exist?

3. (5 points). Find the limit $\lim_{x \to -\infty} \frac{2x^2 - 3x + 1}{(3x+1)^2}$, if it exists.