1. (4 points) Find $\cos(\sin^{-1}(-4/5))$.

\[
\Theta = \sin^{-1}(4/5)
\]

\[
\cos(\sin^{-1}(-4/5)) = \cos(\Theta) = \frac{3}{5}
\]

2. (12 points) Find the following limits.

(a) \[
\lim_{x \to 2} \frac{x^2 - 4}{4 - 2x} = \lim_{x \to 2} \frac{(x-2)(x+2)}{(-2)(x-2)} = \lim_{x \to 2} \frac{x+2}{-2} = -2
\]

(b) \[
\lim_{x \to 1^-} \frac{3x}{x+1} = -\infty
\]

for $x$ close to, but $< -1$, $3x$ is $-$ and $x+1$ is $-$.  

(c) \[
\lim_{x \to -\infty} \frac{\sqrt{4x^2 + 3}}{x} = \lim_{x \to -\infty} \frac{\sqrt{4x^2}}{x} = \lim_{x \to -\infty} \frac{2|\sqrt{x}|}{x} = \lim_{x \to -\infty} \frac{2(-x)}{x} = -2
\]

3. (4 points) Use the definition of continuity to explain why \( f(x) = \begin{cases} \frac{x+2}{\sqrt{x}} & \text{if } x > 0 \\ \frac{2x+4}{x} & \text{if } x \leq 0 \end{cases} \)

is not continuous at 0.

Since \( \lim_{x \to 0^-} f(x) = \lim_{x \to 0^-} \frac{2x+4}{x} = 4 \) and

\[
\lim_{x \to 0^+} f(x) = \lim_{x \to 0^+} \frac{x+2}{\sqrt{x}} = 0
\]

we see that \( \lim_{x \to 0^-} f(x) \neq \lim_{x \to 0^+} f(x) \). Thus, \( \lim_{x \to 0} f(x) \) does not exist, which violates the second condition in the definition of continuity. Hence \( f \) is not continuous at 0.