Problem 1. *(1 point) Is the function* $f(x) = 2x + 1$ *one-to-one? Justify your answer.*

Problem 2. *(1 point) What is* $\sin^{-1}(\sqrt{2}/2)$*?*

Problem 3. *(2 points) Here are seven of the Limit Laws:*

1) $\lim_{x\to a}[f(x) + g(x)] = \lim_{x\to a} f(x) + \lim_{x\to a} g(x)$

2) $\lim_{x\to a}[f(x) - g(x)] = \lim_{x\to a} f(x) - \lim_{x\to a} g(x)$

3) $\lim_{x\to a}[cf(x)] = c\lim_{x\to a} f(x)$

4) $\lim_{x\to a}[f(x)g(x)] = (\lim_{x\to a} f(x)) \cdot (\lim_{x\to a} g(x))$

5) $\lim_{x\to a}[f(x)/g(x)] = (\lim_{x\to a} f(x)) \,/\, (\lim_{x\to a} g(x))$ *if* $\lim_{x\to a} g(x) \neq 0$

6) $\lim_{x\to a} c = c$

7) $\lim_{x\to a} x = a$

Using ***only*** *these rules, compute the following limit. Use only one rule in each step of your calculation, and tell me which rule you are using.*

$$\lim_{x\to 1} \frac{x+1}{3} =$$

Problem 4. *(2 points each) Compute the following limits, or explain why they don't exist. Make sure to show your work.*

(a) $\lim_{h\to 0} \dfrac{(3+h)^2 - 9}{h}$

(b) $\lim_{x\to 1} f(x)$, *where* $f(x) = \begin{cases} x^3 & \text{if } x < 1 \\ \sqrt[13]{x} & \text{if } x > 1 \end{cases}$

(c) $\lim_{x\to 0} x \sin(\pi/x)$