Warm-up Problems

1. Define/explain the following terms:
   (a) Function
   (b) Domain
   (c) Range
   (d) Independent variable
   (e) Dependent variable
   (f) Graph
   (g) Increasing function
   (h) Decreasing function
   (i) Even function
   (j) Odd function

2. What is the relation between radians and degrees? How do you convert between them? Who uses degrees and who uses radians?

3. What is the relation between the length of a circular arc and the degree of that arc. (Yes, there is a formula, but how can you derive the formula if you forget it?)

Lecture Problems

4. Find the (natural) domain and range of the functions.
   (a) \( f(x) = \frac{1}{x-1} \)
   (b) \( f(x) = \frac{1}{\sqrt{x-1}} \)
   (c) \( f(x) = \frac{\sqrt{\ln(x+1)}}{x^2-1} \)

5. Given \( f(x) = \sqrt{x}, g(x) = \frac{1}{x+1} \) and \( h(x) = \sin x \) find:
   (a) \( f \circ g(x) = \)
   (b) \( f \circ f(x) = \)
   (c) \( f \circ g \circ h(x) = \)
   (d) \( f \circ h \circ g \circ f \circ f \circ g(x) = \)

6. Let \( f(x) = x^2 \). Graph on the same axes, compare: \( f(x + 1), f(x - 3), f(x) + 1 \)

7. Let \( f(x) = \sin x \). Graph on the same axes, compare: \( f(x + 1), f(x - 1), f(x) + 1 \)

8. Suppose you know that \( \sin x = \frac{13}{17} \), what is \( \cos x \)?

9. Suppose you know that \( \sin x = \frac{17}{13} \), what is \( \cos x \)?