

# Homework 24 Warm-Up Exercises

MATH 130: Calculus I, Sections 2 and 3  
Fall Semester 2013

**Due:** at the beginning of class on Wednesday, October 30th

Before completing the warm-ups, reread Section 3.10. Recall that in the Reading Assignment I noted that these problems have several steps. What I called “Step 1” in the Reading Assignment really has three parts to consider. Here are all the steps you should be showing for each problem:

- (a) Draw a diagram. (This should illustrate the situation and assist in your next step.)
- (b) Identify/define all variables. (For example, you might write, “Let  $r$  = the radius of the oil spill.”)
- (c) State what you are given and what you want to find. (Usually this will be showing what rates of change you know and what rate of change you want to find.)
- (d) Find an equation relating the variables in (c). (This might be an equation for area or volume, or might be the Pythagorean Theorem, or anything we have seen before in our mathematical past!)
- (e) Differentiate the equation in (d) with respect to  $t$ , time.
- (f) Substitute known values and obtain your final answer.

Be sure to show each of these steps for each of the Section 3.10 Warm-Up exercises. Even if you are having trouble completing the problems, you should do as many of the steps as you can and try to figure out what is your road block for the step beyond.

1. If  $f(x) = 2x + \cos x$  where  $0 \leq x \leq \pi$ , find  $(f^{-1})'(1)$ . (Remember that we don't need to find  $f^{-1}(x)$ . We just need to know what  $f^{-1}(1)$  is. How do we find that? Don't feel like you have to solve an equation to find out. Think about the properties of inverse functions and guess and check!)
2. Section 3.10 (pages 214-215): 6, 9, 12, 17 and 23.