Math 15.1 — F 2000
First homework sets

Date due:

F 9/22
Stewart: §5.3: 1; 4; 47(a), (b); 53. §5.5: 9; 26; 49; 63; 64.
Also: Use translation of axes to recognize the graph of \( f(x) = \frac{x}{1-x} \) as a suitable modification of the graph of \( h(x) = \frac{1}{x} \).

M 9/25
Stewart: §10.1: 3; 7. §10.2: 1; 2(b); 3-6. §10.3: 9; 12; 15.
Also: Newton’s Law of Cooling asserts that, if a hot object of temperature \( T \) is exposed to an ambient environment of constant cooler temperature \( A \), then the rate of change of temperature of the object as it cools is proportional to the difference between the temperature of the hot object and the temperature of the ambient medium.

(a) Express this relationship as a differential equation. Does it matter whether you use the centigrade or the Kelvin temperature scale? Why or why not?

(b) A cross-country skier takes a pot of boiling tea (100° C) outside from the lodge. Five minutes after she leaves the lodge, the tea has cooled to 50° C. Ten minutes after her departure from the lodge, the tea has cooled to 20° C. How cold is it outside? [Extra credit: What wax should she use?]