Assignment #4

Extra office hour: Tuesday, October 26, 1-2.

Problems due in lecture on **Wednesday,** October 27:

§	page	NTHI	THI
§3.6	p. 139	6(c,d), 10(c)	8, 18(a)
§4.1	p. 157	1(all, any method),3(b,c), 4(a,d,m)	2(a,e,h), 3(f,g,h), 4(b,f,g,p)

Also to hand in:

Problem K-1. Prove that the derivative of x^n is nx^{n-1} (for $n = 1, 2, \ldots$) by a direct proof rather than by induction. Use the binomial theorem.

(The direct proof for $n = 2$, for example, would be that if $f(x) = x^2$ then $f'(x) = \lim_{h\to 0} \dfrac{f(x+h) - f(x)}{h} = \lim_{h\to 0} \dfrac{(x+h)^2 - x^2}{h} = \cdots =$
$\lim_{h\to 0}(2x + h) = 2x$.
Of course, x is treated as a constant while you're taking the limit $h \to 0$. For this problem, you'll need to fill in the missing steps and do this for n in place of 2, without saying which integer n is and without assuming the case $n - 1$. Express the reasoning as best you can.)