Class 28 HW SOLUTIONS **to selected problems**. Math 110, Fall 98

Was due Monday, 11/16/98: HH, page 134: 12.

12.

(a) $f(x) = \dfrac{x+3}{2-x} = \dfrac{1+3/x}{2/x-1}$.

So, $\lim_{x\to\infty} f(x) = \dfrac{1+0}{0-1} = -1$.

Note: This method of dividing both the numerator and the denominator by the highest power of x is not the only way to do these problems. In fact, it's not even the easiest way! It is the most rigorous way, but in this class we are not being too concerned with rigorous proofs. Therefore, for most of the following problems, I'll just do them the "easier" way, namely by just seeing what the limit is by plugging in a large value for x—I will not actually show the calculations involved, only the answers. But you should really plug in a relatively large value (usually 100 or 1000 is large enough, sometimes even too large for the calculators) in your calculators and really see what happens.

(b) 1/3

(c) ∞

(d) 2/3

(e) 0

(f) 3/2

(g) $f(x) = \dfrac{2e^{-x}+3}{3e^{-x}+2} = \dfrac{2e^{-x}+3}{3e^{-x}+2} \cdot \dfrac{e^x}{e^x} = \dfrac{2+3e^x}{3+2e^x}$

So, $\lim_{x\to\infty} f(x) = 3/2$.