Math 1720 Homework 1B, due Friday Jan 27

1.

(a) Make transformations on the graph of $y = \ln(x)$ to sketch the graph of $y = \ln(10x)$ (the fact that $\ln(10) \approx 2.3$ might be useful). What is the domain of $\ln(10x)$?

(b) Make transformations on the graph of $y = \ln(x)$ to sketch the graph of $y = 4 - 2\ln(10x)$. What asymptotes (horizontal, vertical) does this graph have? Find the limit

$$\lim_{x \to \infty} 4 - 2\ln(10x),$$

and make sure your graph agrees with this.

(In both parts, make sure to explain the various transformations involved.)

2.(a) Write the following in terms of $\ln(3)$, $\ln(12)$ and $\ln(2)$:

$$\ln(3^4 * \frac{12}{2^{-5}}).$$

(b) Write the following in the form $\ln(p(x))$, where $p(x)$ is a polynomial:

$$\ln(4x) - \ln(14) + 2\ln((x+1)^3).$$

3. In each part, find all solutions x to the equation:

(a)

$$\ln(3x^2 + 1) - \ln(2) = \ln(x^2) + \ln(4).$$

(b)

$$\ln(2 - x) + \ln(1 - x) = \ln(6).$$

4. From the text, problems §7.2: 5, 7, 9, 11, 4.

Note: in problem §7.2:4, used a transformation on the graph of $y = \ln(x)$ to obtain the graph of $y = \ln(|x|)$. Use what you know about the derivative of $y = \ln(x)$ to help in explaining what the derivative of $y = \ln(|x|)$ is.