Math-08 Homework #14

Reading

- Text book chapter 4

Problems

Make sure that all sketches have all important points and asymptotes clearly marked.

1). List the transformations, find all intercepts, and sketch:

$$y = -2e^{x+1} + 5$$

2). List the transformations, find all intercepts, and sketch:

$$y = 3\ln(x-2) + 1$$

3). Given:

$$\log_b 2 = 0.6931$$

$$\log_b 3 = 1.0986$$

$$\log_b 5 = 1.6094$$

find $\log_b\left(\frac{75}{4}\right)$. You must use each one of the given values, you are not allowed to determine the value of b, and you must show exactly how you obtained the answer.

4). Consider the equation: $y = \log_a x$

a). Derive the change of base formula for some arbitrary base b.

b). Use your formula with $b = e$ and your calculator to compute $\log_7 100$.

c). Assume that you made a mistake and used the common log key instead of the natural log key in the above calculation. Would you get a different answer? Why or why not?

5). Researchers tend to prefer exponential (base e) equations. For example, the normal equation for the radioactive decay of Carbon-14, which has a half-life of 5730 years, would be:

$$A = A_0 \cdot 2^{-\frac{t}{5730}}$$

But the preferred exponential equations is:

$$A = A_o e^{-\frac{t}{a}}$$

Solve for a, rounding to the nearest integer value.