MATH 27
Fall 2022

WEEKLY REVIEW #6

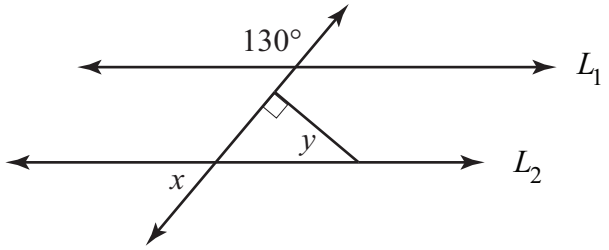
DUE: Thursday, October 6

NOTE: These problems are to be done on Engineering paper, using the standard homework format. You may consult with me or with other students on this assignment. Questions about these problems will not be answered during class.

1. Solve the equation: $e^{2x} - 7e^{x} + 6 = 0$. Give the solutions to three decimal place accuracy.
   [*Hint*: Factor the left-hand side.]

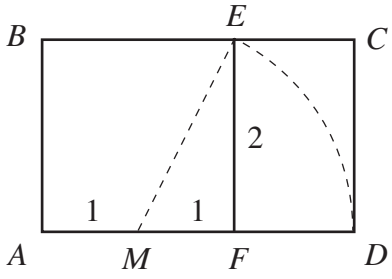
2. A business model predicts that the percentage of the market their new product will capture is given by the function $M(t) = \dfrac{66}{1+10e^{-0.05t}}$, where $M(t)$ represents the percentage after *t* days. How long will it take the company to reach a 60% market share?
   [*Hint*: Solve the equation $M(t) = 60$ **algebraically**.]

3. In the adjacent figure, $L_1 \| L_2$.
   Find *x* and *y*.



4. Find the length of the longest object that will fit inside a cylinder that has a radius of 2 cm and height 34 cm. Leave your answer in simplified radical form.

5. Rectangle *ABCD* is a *golden rectangle*. It is constructed from square *ABEF* by drawing an arc of a circle, centered at point *M* with radius *ME* intersecting *AF* at *D*. Then constructing a perpendicular to *AF* at *D* intersecting *BE* at *C*. The ratio of the length to the width in the golden rectangle is called the *golden ratio*



   Find the **exact value** of the golden ratio $\dfrac{AD}{AB}$.

   Note: An **exact value** is not an approximation. Do not give a calculator answer.