Instructions. Put your first and last name at the top of your paper. Everyone is to do their own worksheet but only one from each group is graded with the score shared. Be sure to show your work and explain your reasoning. All worksheets from each group will be collected. This worksheet has two sides, and two problems.

1. Let \( f(x) = x - \frac{1}{6}x^2 - \frac{2}{3}\ln x \)

   (a) Find any vertical or horizontal asymptotes of \( f \).

   (b) Find intervals of increase or decrease using the First Derivative Test (page 291).

   (c) Find the local minimum and maximum values.

   (d) Find the intervals of concavity and inflection points.

   (e) Use the information from parts (a)-(d) to sketch the graph of \( f \). Clearly draw any vertical and/or horizontal asymptotes in your graph. Label all the points you found in parts (c) and (d) in your graph.
2. A rectangular storage container with an open top is required have a volume of 10 m³. The length of its base is twice the width. Material for the base costs $10 per square meter. Material for the sides costs $6 per square meter. Find the cost of materials for the cheapest such container.