Math 131 - April 6, 2016

Warm-up Problems

1. Determine if there is a slant asymptote and find it if there is one:

   (a) $y = \frac{x^3-12x^2+38x-17}{x-7}$

   (b) $y = \frac{x^3-12x^2+38x-17}{x^2-7}$

   (c) $y = \frac{x^3-12x^2+38x-17}{x^3-7}$

Lecture Problems

For the optimization problems below

- Identify what is being asked to optimize. Are you being asked to find a max or a min? (You probably want to draw a picture at this stage!)
- Find a function to represent what is to be optimized.
- Find the domain of your function.
- Optimize and solve the problem

2. Find 2 positive numbers whose sum is 50 and product is as large as possible.

3. Find the point(s) on the curve $y = 25 - x^2/4$ closest to the origin.

4. A farmer has 2400 ft of fencing and wants to fence off a rectangular field that borders a straight river. He needs no fence along the river. What are the dimensions of the field that has the largest area?

5. A window is being built and the bottom is a rectangle and the top is a semicircle. If there is 12 m of framing materials what must the dimensions of the window be to let in the most light?

6. A triangle has an angle θ and side lengths of 3 on either side of the angle θ. Find the value of θ so that the isosceles triangle will have the largest area.