Review Problems

November 11, 2016

- 1. An observer is stationed 2 miles from a rocket launch pad. The rocket rises vertically off the launch pad. h denotes the height of the rocket (in miles), and z denotes the distance from the observer to the rocket (in miles). Find a formula for $\frac{dz}{dt}$.
- 2. (Fall 2002, Exam 3, #5) Find the two points on the parabola $2y = x^2 8$ that are closest to the point (0, 4).
- 3. (Fall 2003, Exam 3, #11) A rain gutter is to be constructed from a metal sheet of width 24 cm by bending up one-third of the sheet on each side through an angle θ . What is the function to be maximized in order to choose θ so that the gutter will carry the maximum amount of water?
- 4. (Fall 2005, Exam 3, #1) Find two positive numbers x and y satisfying x + 2y = 80 whose product is a maximum.
- 5. (Fall 2005, Exam 3, #2) A box with a square base has volume $100in^3$ and dimensions $b \times b \times h$. Find a formula for its surface area A(b) in terms of b.