## BASIC CALCULUS I *Class 21* Friday October 23 Applications of Derivatives: General Rules for Optimization

**Warm-Up** Find the global and local extrema (maxima and/or minima) of the function  $y = x^{2/3}$  on [-2,3]

## General Method for solving Optimization problems:

- 1. Draw a picture and assign appropriate variables.
- 2. Write a formula for the quantity to be maximized or minimized.
- 3. Use the conditions of the problem to eliminate one variable.
- 4. Determine all of the crucial points for increasing and decreasing  $(\uparrow,\downarrow)$ .
- 5. Obtain the maximum or minimum, whichever is desired.

GROUPWORK: In groups of 3 or 4 work on the following optimization problem.

[1]. The range R of a projectile fired with an initial velocity V at an angle  $\theta$  with the horizontal is  $R = \frac{V^2 \sin(2\theta)}{g}$  where g is the acceleration due to gravity. Find the angle  $\theta$  which maximizes the range R of the projectile.

## Homework: *H-H* page 275 2, 4 and 5 AND *CiC page 289, # 2* Due Mon Oct 26. Reading: *CiC* READ 280–293. Reminder: Exam 2 is scheduled for Thursday October 29 in lab The FINAL EXAM in Math 110 is scheduled for Thursday December 10 6:30-9:30 pm

## ANNOUNCEMENTS