MATH 111-007 QUIZ 8

Problem 1. Consder $g(x) = \sqrt{4 - x^2}$ on $[-2, 1]$. Find all absolute and local extrema on this interval (recall the steps).

Problem 2. We have a piece of square cardboard of side length 2. At each corner, we cut off a square of side length x, fold up the sides to make a box with an open top. To maximize the volume of this box, what should x be and what's the resulting maximal volume?

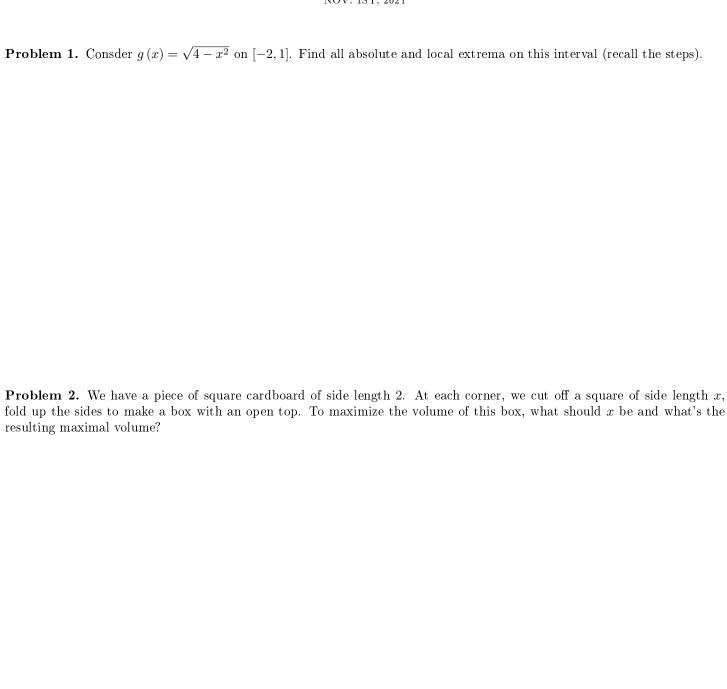**Problem.** (Bonus) The height of a body moving vertically (subject to free fall) is given by

$$s = -\frac{1}{2}gt^2 + v_0 t + s_0, \quad g > 0$$

where v_0 and s_0 are the known initial velocity and position respectively. Find the body's maximum height (expressed in terms of the known constants v_0, s_0 and g).