
Due: Midnight, Oct. 12

In **30 minutes** do the following problems, **without help** from any references, computing devices, or people. Write your solutions on either a printout or blank paper. If you use blank paper, do the problems on **1 sheet of paper, in the order given**. Upload a pdf of your solutions to **Gradescope, by midnight**.

Show your work.

1. A dam is shaped like the region inside the parabola $y = 2x^2 - 200$ below the x -axis, with x, y measured in ft . Water is held behind the dam all the way up to its top. Find the total pressure the water exerts on the dam. (The weight density of water is $62.5 \text{ lbs}/ft^3$.)
2. Compute the center of mass (\bar{x}, \bar{y}) of the quarter disc that is bounded by $x^2 + y^2 = 25$ and lies in the first quadrant. (You may use symmetry and the formula for the area of a disc to reduce your effort.)