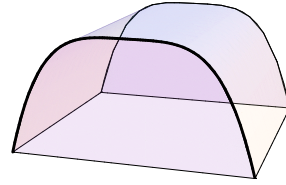
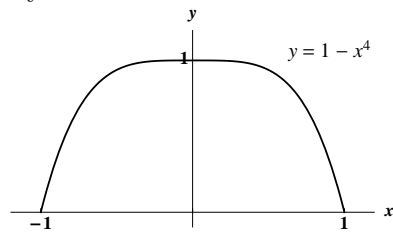


6. [11 points] The lateral faces of a tank are determined by the curve $y = 1 - x^4$ and the x -axis (where x and y are measured in meters). The length of the tank is 10 meters. Be sure to include units in your answers.



- a. [5 points] The tank is filled with water to a height of one half a meter. If the density of water is $1,000 \text{ kg/m}^3$, write an expression that approximates the mass of one slice of water y meters above the ground and Δy meters thick.
- b. [2 points] Write a definite integral that represents the total mass of water in the tank.
- c. [4 points] Write a definite integral that represents the amount of work required to pump the water to the top of the tank.