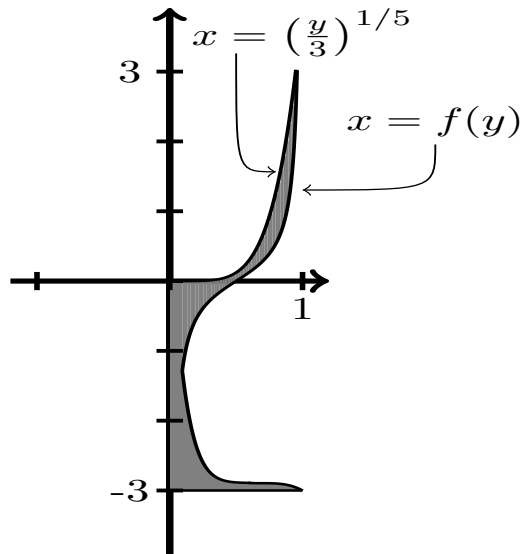


7. [12 points]

- a. [5 points] You rotate the region shown about the  $y$ -axis to create a drinking glass. Write an expression that represents the volume of material required to construct the drinking glass (your answer may contain  $f(y)$ ).



- b. [7 points] Consider the vessel shown below. It is filled to a depth of 1 foot of water. Write an integral in terms of  $y$  (the distance in  $ft$  from the bottom of the vessel) for the work required to pump all the water to the top of the vessel. Water weighs  $62.4 \text{ lbs/ft}^3$ .

