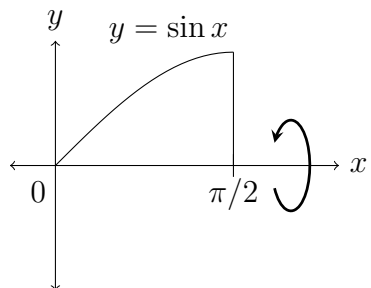
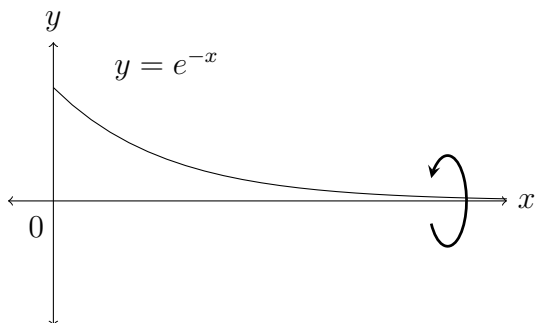

Area of a Surface of Revolution

Solutions should show all of your work, not just a single final answer.

1. Set up, but **do not evaluate**, a definite integral for the area of the surface formed by revolving the curve $y = \sin x$ for $0 \leq x \leq \pi/2$ around the x -axis.



2. Set up, but **do not evaluate**, an improper definite integral for the area of the surface formed by revolving the curve $y = e^{-x}$ for $x \geq 0$ around the x -axis.



3. (**Bonus**) Let S_1 and S_2 be the surface areas from problems 1 and 2, respectively. Use integration by substitution to show $S_1 = S_2$.
4. T/F (with justification): Doubling the radius of a sphere will double the surface area of the sphere.