

1. The arc of a parabola  $y^2 = x$  from  $(1,1)$  to  $(4,2)$  is revolved about the x-axis. Find the area of the resulting surface?

2. If  $f$  and  $g$  are inverse functions and  $f(x) = e^{2x} + 2e^x + 1$ , where  $x \geq 0$ , find the slope of the tangent line to the graph of  $g(x)$  at  $(4,0)$ .

3. What is the base  $b$  when  $554$  in base  $b$  is the square of  $24$  in base  $b$ ?