

### Section 6.5 Area of a Surface of Revolution

If  $f$  is a smooth, nonnegative function on  $[a, b]$ , then the surface area  $S$  of the surface of revolution that is generated by revolving the portion of the curve  $y = f(x)$  between  $x = a$  and  $x = b$  about the  $x$ -axis is defined as

$$S = \int_a^b 2\pi f(x) \sqrt{1 + [f'(x)]^2} dx.$$