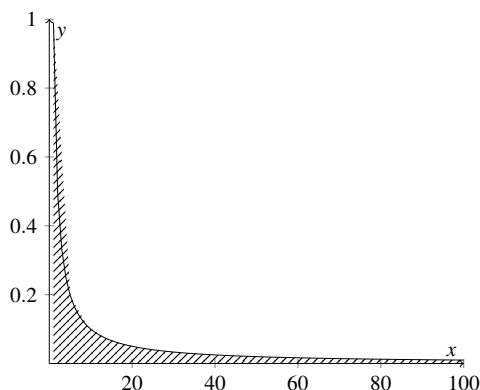
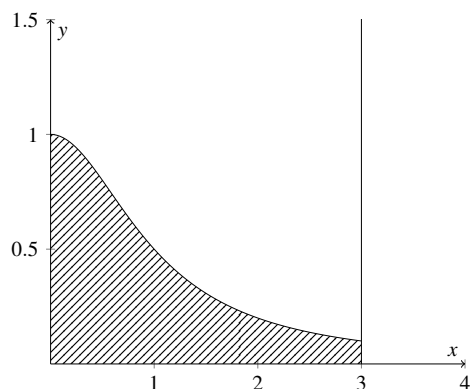


122. $y = \frac{1}{x}$, $x = 1$, and $x = 100$



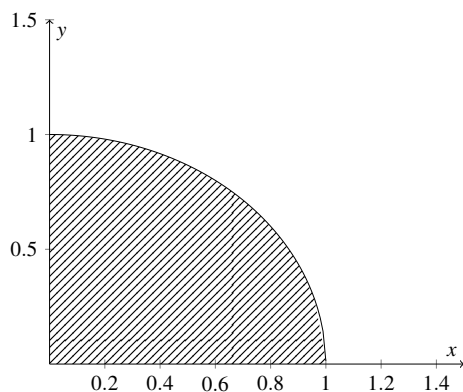
$$\begin{aligned} V &= 2\pi \int_1^{100} \left(\frac{1}{x}\right) dx \\ &= 2\pi \ln(x) \Big|_1^{100} \\ &= 2\pi(\ln(100) - \ln(1)) \\ &= \boxed{2\pi \ln(100)} \end{aligned}$$

124. $y = \frac{1}{1+x^2}$, $x = 0$, and $x = 3$



$$\begin{aligned} V &= 2\pi \int_0^3 \left(\frac{1}{1+x^2}\right) dx \\ &= 2\pi \tan^{-1}(x) \Big|_0^3 \\ &= \boxed{2\pi[\tan^{-1}(3) - \tan^{-1}(0)]} \end{aligned}$$

130. $y = \sqrt{1-x^2}$, $x = 0$, and $x = 1$



$$\begin{aligned} V &= 2\pi \int_0^1 (\sqrt{1-x^2}) dx \\ \text{Using } a^2 - u^2 &\rightarrow u = a \sin \theta, \quad du = a \cos \theta d\theta \\ x &= \sin \theta, \quad dx = \cos \theta d\theta \quad \theta = \sin^{-1} x \\ \Rightarrow V &= 2\pi \int (\sqrt{1-\sin^2 \theta} \cos \theta) d\theta \\ &= 2\pi \int (\sqrt{\cos^2 \theta} \cos \theta) d\theta = 2\pi \int (\cos^2 \theta) d\theta \\ &= 2\pi \int \left(\frac{1+\cos 2\theta}{2}\right) d\theta \Rightarrow 2\pi \left(\frac{\theta + \sin 2\theta}{2}\right) \Rightarrow 2\pi \left(\frac{\sin^{-1} x + \sin \sin^{-1} x}{2}\right) \Big|_0^1 \\ &= 2\pi \left(\frac{\frac{\pi}{2} + 1 - 0}{2}\right) = 2\pi \left(\frac{\frac{\pi}{2} + 1}{2}\right) = \boxed{\pi + \pi} \end{aligned}$$