1. $\frac{103}{6} = 17\frac{1}{6}$

2. $V = \frac{4}{3}\pi ab^2$

3. $V = \frac{\pi}{2}$

4. $\frac{\sqrt{5}\pi}{2}$

5. $\frac{2}{5}(2^{5/2} - 1)$

6. $W = \frac{3^8}{56} \sim 117.16$ inch-pounds.

7. $W = 32$ dynes.

8. $\int_{x=0}^{x=1} 2\pi x(x^3)dx = 2\pi|_0^1 \frac{x^5}{5} = \frac{2\pi}{5}$

   The centroid of the region is $(\bar{x}, \bar{y}) = (\frac{4}{5}, \frac{2}{7})$. The area of the region is $\frac{1}{4}$. The distance swept out by the centroid is 2π times $\frac{4}{5}$, its distance from the axis of revolution. Multiplying these according to Pappus' volume theorem (there is also an area theorem) gives $\frac{1}{4}(2\pi\frac{4}{5} = \frac{2\pi}{5}$, confirming Pappus' Theorem in this case.