1. In 3-D.

(a) Area of the slice: \((2y)^2 = 4y^2 = 4x\)

\[
\int_0^q 4x \, dx
\]

slice \perp x axis, so integral with respect to \(x\)

(b) Semicircle: \(r = y = \sqrt{x}\)

\[
\frac{\pi}{2} \int_0^q x \, dx
\]

(c) Equilateral triangle:

\[h = 2y \sin \frac{\pi}{3} = \sqrt{3}y\]

\[
\int_0^q \frac{1}{2} \cdot 2y \cdot h \, dx = \int_0^q \sqrt{3}x \, dx
\]
2. (a) "Washer"
\[ R_{out} = 8 \]
\[ R_{in} = y = x^3 \]
\[ \int_0^2 \pi \left[ 8^2 - (x^3)^2 \right] dx \]

(b) "Shell"
\[ r = y, \quad l = x = y^{1/3} \]
\[ \int_0^8 2\pi y^{4/3} dy \]

"Shell"
\[ r = x, \quad l = 8 - y = 8 - x^3 \]
\[ \int_0^2 2\pi x (8 - x^3) dx \]

"Washer"
\[ R_{out} = x, \quad R_{in} = 0 \]
\[ \int_0^8 \pi \left[ x^2 - 0^2 \right] dy \]
\[ = \int_0^8 \pi y^{3/2} dy \]