12.6

Trace: set any one of $x, y, z$ to a constant and sketch the 2-D curve given by the resulting equation. (Z-traces are also called level curves)
eg. what is (and sketch)

\[ 23y^2 + z^2 = 100 + 4x^2 \]

\[-x^2 \quad 2 \quad 2 \quad 2 \]
\[ \frac{a^2}{25} \quad \frac{y^2}{4} \quad \frac{z^2}{100} = 1 \]

\[-x^2 \quad 2 \quad 2 \quad 2 \]
\[ \frac{a^2}{5^2} \quad \frac{y^2}{2^2} \quad \frac{z^2}{10^2} = 1 \]

"Waist" is in the y-z plane
\[ \frac{y^2}{2^2} + \frac{z^2}{10^2} = 1 \]

do another
\[ x = \text{trace} \]

so \[ x = 5 \]

got \[ \frac{y^2}{(5^2)^2} + \frac{z^2}{(10^2)^2} = 2 \]

\[ \frac{y^2}{(5^2)^2} + \frac{z^2}{(10^2)^2} = 1 \]
\[ \frac{x}{(1/3)^2} + (y-1)^2 = (z-1)^2 \]