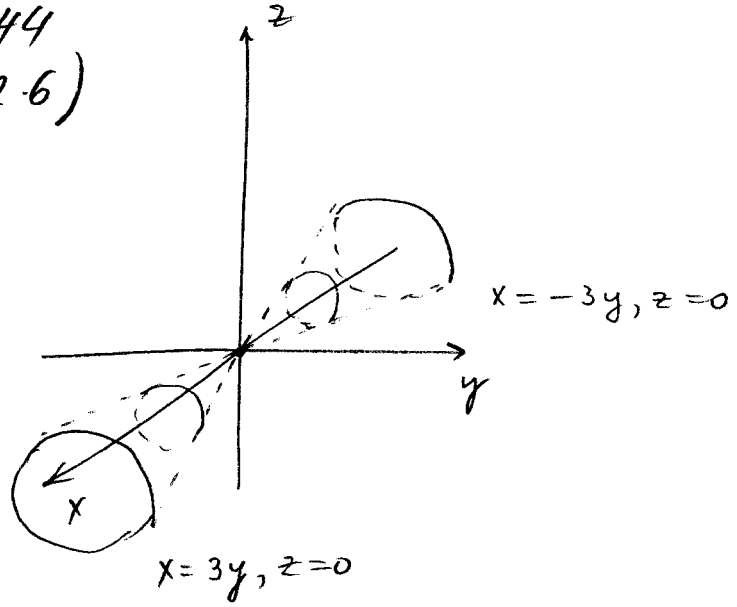
#44 (12.6)



Circular cylinder

$$\left(\frac{x}{3}\right)^2 = y^2 + z^2$$

or

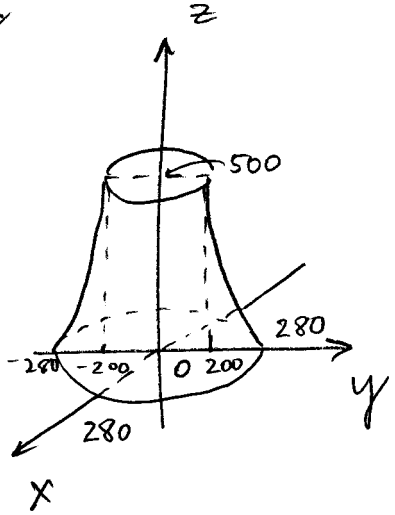
$$x^2 = 9y^2 + 9z^2.$$

#46 (12.6)

$$\sqrt{y^2+z^2} = 2|x|$$

$$y^2 + z^2 = 4x^2$$ – circular cone, obtained by rotating the line $y = 2x$ about the x-axis.

#48 (12.6)



$$\frac{x^2}{a^2} + \frac{y^2}{a^2} - \frac{(z-500)^2}{c^2} = 1$$

base is circular, so "$a = b$".

$z = 500 \Rightarrow x^2 + y^2 = 200^2$

$\Rightarrow a = 200.$

$z = 0 \Rightarrow x^2 + y^2 = 280^2$

$$\Rightarrow 200^2\left(1 + \frac{500^2}{c^2}\right) = 280^2$$

$$\Rightarrow \left(\frac{500}{c}\right)^2 = \frac{280^2}{200^2} - 1 = \left(\frac{7}{5}\right)^2 - 1 = \frac{24}{25}$$

$$\left(\frac{500}{c}\right)^2 = \frac{24}{25}$$

$$\left(\frac{c}{500}\right)^2 = \frac{25}{24}$$

$$\frac{c}{500} = \sqrt{\frac{25}{24}}$$

$$c = 500 \cdot \sqrt{\frac{25}{24}} \approx 510.31$$