(5) $r=2$

$r^2 = x^2 + y^2$

$y = x^2 + y^2$

Circular cylinder with a radius of 2, centered around the Z axis

(7) $r^2 + z^2 = 4$ $x^2 + y^2 + z^2 = 4$

$r^2 = x^2 + y^2$

Sphere with a radius of 2 centered at $(0,0,0)$

(9)

a.) $x^2 - x + y^2 + z^2 = 1$ $x^2 + y^2 = r^2$

$-x = -r\cos\theta$

$r^2 - r\cos\theta + z^2 = 1$

$$\boxed{z^2 = 1 + r\cos\theta - r^2}$$

b.) $z = x^2 - y^2$

$x = r\cos\theta$ $y = r\sin\theta$

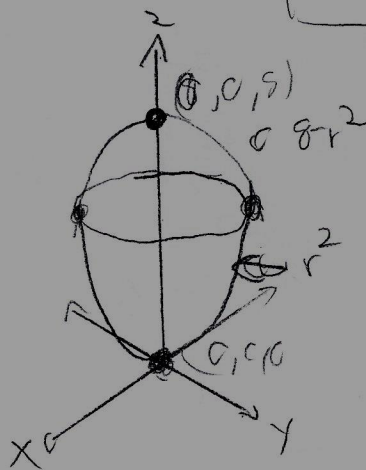$z = r^2\cos^2\theta - r^2\sin^2\theta$

$$\boxed{z = r^2\cos 2\theta}$$

(11) $r^2 \leq z \leq 8 - r^2$

$z = r^2$ $z = 8 - r^2$

$z = x^2 + y^2$ $z = 8 - (x^2 + y^2)$

(13) 20 cm long $20 = $ max length $0 = $ min length $z \in [0, 20]$ Circular cross sections $\theta \in [0, 2\pi]$

inner radius $= 6$ cm   outer $= 7$ cm $r \in [6, 7]$

$$\boxed{E = \{(r, \theta, z) \mid 6 \leq r \leq 7 \wedge 0 \leq \theta \leq 2\pi \wedge 0 \leq z \leq 20\}}$$