3. a) $\frac{\pi r^2}{4} = \frac{r^2 (\varphi - \sin(\varphi))}{2}$

$$\frac{\pi r^2}{4} = \frac{2r^2 (\varphi - \sin(\varphi))}{4}$$

$$\pi r^2 = 2r^2 (\varphi - \sin(\varphi)) \mid : 2r^2$$

$$\frac{\pi r^2}{2r^2} = \varphi - \sin(\varphi)$$

$$\frac{\pi}{2} = \varphi - \sin(\varphi)$$

$$-\varphi + \sin(\varphi) = -\frac{\pi}{2}$$

$$\sin(\varphi) - \varphi = -\frac{\pi}{2}$$ ✓

b) $\sin(\varphi) + 0.5\pi = \varphi$

$\varphi_0 = 2.3 \rightarrow \sin(2.3) + 0.5\pi = 2.317$

$\varphi_1 = 2.317 \rightarrow \sin(2.317) + 0.5\pi = 2.305$

$\varphi_2 = 2.305 \rightarrow \sin(2.305) + 0.5\pi = 2.313$

$\varphi_3 = 2.313 \rightarrow \sin(2.313) + 0.5\pi = 2.308$

$\varphi_4 = 2.308 \rightarrow \sin(2.308) + 0.5\pi = 2.311$

$\varphi_5 = 2.311 \rightarrow \sin(2.311) + 0.5\pi = 2.309$

$\varphi_6 = 2.309 \rightarrow \sin(2.309) + 0.5\pi = 2.310$

$\varphi_7 = 2.310 \rightarrow \sin(2.310) + 0.5\pi = 2.310$

$\varphi_8 = 2.310 \rightarrow \sin(2.310) + 0.5\pi = 2.310$

c) $h = r \cdot \left(1 - \cos\left(\frac{\varphi}{2}\right)\right)$