

(1) [7 points] Determine all solutions to

$$\sin\left(\frac{\theta}{2}\right) = -\frac{\sqrt{3}}{2}$$

where $0 \leq \theta < 4\pi$.

(2) [8 points] Determine all solutions to

$$\cos(2\theta) + 6 \sin^2 \theta = 4$$

where $0 \leq \theta < 2\pi$.