8.3.35 If $\sin\theta = 1/2$, then θ is

$$\arcsin\frac{1}{2} + 2\pi k \text{ or } \pi - \arcsin\frac{1}{2} + 2\pi k$$

for some integer k. Since $\arcsin(1/2) = \pi/6$, θ is

$$\frac{\pi}{6} + 2\pi k \text{ or } \frac{5\pi}{6} + 2\pi k$$

for some integer k. That is, θ is one of these numbers:

$$\ldots, \frac{\pi}{6}, \frac{5\pi}{6}, \frac{13\pi}{6}, \frac{17\pi}{6}, \frac{25\pi}{6}, \frac{29\pi}{6}, \ldots.$$

8.6.69 I have a choice of identities for $\cos 2\theta$; since the equation otherwise involves $\sin\theta$, I'll use the one that also involves $\sin\theta$.

$$\begin{aligned}
\cos 2\theta + 6\sin^2\theta &= 4; \\
1 - 2\sin^2\theta + 6\sin^2\theta &= 4; \\
4\sin^2\theta &= 3; \\
\sin^2\theta &= \frac{3}{4}; \\
\sin\theta &= \pm\frac{\sqrt{3}}{2}.
\end{aligned}$$

For $0 \le \theta < 2\pi$, the values whose sines are $\sqrt{3}/2$ or $-\sqrt{3}/2$ are

$$\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}.$$