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$$\begin{aligned} 1) \quad & \tan \theta \csc \theta \\ & \frac{\sin \theta}{\cos \theta} \left(\frac{1}{\sin \theta} \right) \\ & \frac{1}{\cos \theta} \\ & \boxed{\sec \theta} \end{aligned}$$

$$\begin{aligned} 2) \quad & \sin \theta \cot \theta \\ & \sin \theta \frac{\cos \theta}{\sin \theta} \\ & \boxed{\cos \theta} \end{aligned}$$

$$\begin{aligned} 3) \quad & \cot \theta \csc \theta \\ & \cot \theta \frac{1}{\sin \theta} \\ & \frac{\cos \theta}{\sin \theta} (\sin \theta) \\ & \boxed{\cos \theta} \end{aligned}$$

$$\begin{aligned} 4) \quad & \frac{\sin \theta}{\tan \theta} \\ & \sin \theta \frac{1}{\tan \theta} \\ & \sin \theta \cot \theta \\ & \sin \theta \frac{\cos \theta}{\sin \theta} \\ & \boxed{\cos \theta} \end{aligned}$$

$$\begin{aligned} 5) \quad & 4 \cos x + 2 = 0 \\ & 4 \cos x = -2 \\ & \cos x = -\frac{1}{2} \end{aligned}$$

$$\boxed{x = \frac{2\pi}{3} \quad ; \quad x = \frac{4\pi}{3}}$$

$$\begin{aligned} 6) \quad & 4\sqrt{3} \csc x - 8 = 0 \\ & 4\sqrt{3} \csc x = 8 \\ & \sqrt{3} \csc x = 2 \\ & \csc x = \frac{2}{\sqrt{3}} \\ & \sin x = \frac{\sqrt{3}}{2} \end{aligned}$$

$$\boxed{x = \frac{\pi}{3} \quad ; \quad x = \frac{2\pi}{3}}$$