

2.8

$$\sin^2 2x - \sin^2 x = \frac{1}{2}$$

$$(\sin 2x - \sin x)(\sin 2x + \sin x) = \frac{1}{2}$$

$$2\sin\left(\frac{1}{2}x\right)\cos(1.5x) \cdot 2\sin(1.5x)\cos(0.5x) = \frac{1}{2}$$

$$\sin(3x)\sin(x) = \frac{1}{2} \cdot 2$$

$$2\sin(3x)\sin(x) = 1$$

$$\cos 2x - \cos 4x = 1$$

$$\cos 2x - 2\cos^2 x + 1 = 1$$

$$\cos 2x(1 - 2\cos 2x) = 0$$

$$\downarrow$$
$$2x = \frac{\pi}{2} + \pi k$$

$$\boxed{x = \frac{\pi}{4} + \frac{\pi k}{2}}$$

$$k \in \mathbb{Z}$$

$$\downarrow$$
$$\cos 2x = \frac{1}{2}$$

$$2x = \pm \frac{\pi}{3} + 2\pi k$$

$$\boxed{x = \pm \frac{\pi}{6} + \pi k}$$