

2.41
7

$$\sin^2 x + \sin^2 2x = \sin^2 3x + \sin^2 4x$$

$$\sin^2 3x - \sin^2 x = \sin^2 2x - \sin^2 4x$$

$$(\sin 3x - \sin x)(\sin 3x + \sin x) = (\sin 2x - \sin 4x)(\sin 2x + \sin 4x)$$

$$2 \sin x \cos 2x \cdot 2 \sin 2x \cos x = -2 \sin x \cos 3x \cdot 2 \sin 3x \cos x$$

$$\sin 2x \cos 2x + \sin 2x \cos 6x = 0$$

$$\sin 2x (\cos 4x + \cos 6x) = 0$$

↓

$$2x = \pi k$$

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

$$\sin 4x = -\sin 6x = \sin(-6x)$$

$$4x = -6x + 2\pi k$$

$$\boxed{x = \frac{\pi k}{5}}$$

$$4x = \pi + 6x + 2\pi k$$

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