4.7
k2

$n = k+1$

$$\underbrace{\sin\alpha + \sin(3\alpha) + \dots + \sin(2k-1)\alpha}_{} + \sin(2k+1)\alpha \overset{?}{=} \frac{\sin^2((k+1)\cdot\alpha}{\sin\alpha}$$

$$\frac{\sin^2(k\alpha)}{\sin\alpha} + \sin(2k+1)\alpha \overset{?}{=} \text{''}$$

$$\frac{\sin^2(k\alpha) + \sin\alpha\sin(2k+1)\alpha}{\sin\alpha} \overset{?}{=} \text{''}$$

$$\frac{\sin^2 k\alpha + \frac{1}{2}\cos(2k)\alpha - \frac{1}{2}\cos(2k+2)\alpha}{\sin\alpha} \overset{?}{=} \text{''}$$

$$\frac{\sin^2(k\alpha) + \frac{1}{2}(1-2\sin^2(k\alpha)) - \frac{1}{2}(1-2\sin^2(k+1)\alpha)}{\sin\alpha} \overset{?}{=} \text{''}$$

$$\frac{\sin^2(k+1)\cdot\alpha}{\sin\alpha} =$$