

$$\begin{aligned}
\sin 5x \cdot \cos 3x &= \sin 6x \cdot \cos 2x \\
(\sin(5x+3x) + \sin(5x-3x))/2 &= (\sin(6x+2x) + \sin(6x-2x))/2 \\
(\sin 8x + \sin 2x)/2 &= (\sin 8x + \sin 4x)/2 \\
\sin 8x + \sin 2x &= \sin 8x + \sin 4x \\
\sin 2x &= \sin 4x \\
\sin 2x &= 2 \cdot \sin 2x \cdot \cos 2x \\
\sin 2x(2 \cos 2x - 1) &= 0 \\
\sin 2x &= 0 \\
2x &= Pn \\
x &= Pn/2 \\
2 \cos 2x - 1 &= 0 \\
2 \cos 2x &= 1 \\
\cos 2x &= 1/2 \\
2x &= P/3 + 2Pn \\
2x &= 5P/3 + 2Pn \\
x_1 &= P/6 + Pn \\
x_2 &= 5P/6 + Pn \\
\text{Ответ: } &Pn/2; P/6 + Pn; 5P/6 + Pn.
\end{aligned}$$

$$\begin{aligned}
\cos^2 x + \cos^2 2x - \cos^2 3x - \cos^2 4x &= 0 \\
(\cos 2x + 1)/2 + (\cos 4x + 1)/2 - (\cos 6x + 1)/2 - (\cos 8x + 1)/2 &= 0 \\
\cos 2x + \cos 4x - \cos 6x - \cos 8x &= 0 \\
(\cos 2x - \cos 6x) + (\cos 4x - \cos 8x) &= 0 \\
-2 \cdot \sin((2x+6x)/2) \cdot \sin((2x-6x)/2) - 2 \cdot \sin((4x+8x)/2) \cdot \sin((4x-8x)/2) &= 0 \\
-2 \cdot \sin 4x \cdot \sin(-2x) - 2 \cdot \sin 6x \cdot \sin(-2x) &= 0 \\
-2 \cdot \sin(-2x) \cdot (\sin 4x + \sin 6x) &= 0 \\
\sin(-2x) \cdot (\sin 4x + \sin 6x) &= 0 \\
\sin 4x + \sin 6x &= 0 \\
2 \sin((6x+4x)/2) \cdot \cos((6x-4x)/2) &= 0 \\
\sin 5x \cdot \cos x &= 0 \\
\sin 5x &= 0 \\
5x &= Pn \\
x &= Pn/5 \\
\cos x &= 0 \\
x &= P/2 + Pn \\
\sin(-2x) &= 0 \\
-2x &= Pn \\
x &= -Pn/2 \\
\text{Ответ: } &Pn/5; P/2 + Pn; -Pn/2
\end{aligned}$$

$$21) \sin x \cdot \cos y = (\sin(x+y) + \sin(x-y))/2$$

$$22) \cos x \cdot \cos y = (\cos(x+y) + \cos(x-y))/2$$

$$23) \sin x \cdot \sin y = (\cos(x-y) - \cos(x+y))/2$$

$$1) \sin q + \sinh = 2 \sin((q+h)/2) \cdot \cos((q-h)/2)$$

$$2) \sin q - \sinh = 2 \sin((q-h)/2) \cdot \cos((q+h)/2)$$

$$3) \cos q + \cosh = 2 \cos((q+h)/2) \cdot \cos((q-h)/2)$$

$$4) \cos q - \cosh = -2 \sin((q+h)/2) \cdot \sin((q-h)/2)$$