

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

$$\cos 3x = 4 \cos^3 x - 3 \cos x$$

$$\cos x \cdot \cos y = (1/2) \cdot (\cos(x+y) + \cos(x-y))$$

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

$$2 \cos 13x + 3 \cos 3x + 3 \cos 5x - 8 \cos x \cdot \cos^3(4x) = 0$$

$$(2 \cos 13x - 8 \cos x \cdot \cos^3(4x)) + (3 \cos 3x + 3 \cos 5x) = 0$$

$$2(\cos 13x - 4 \cos x \cdot \cos^3(4x)) + 3(\cos 3x + \cos 5x) = 0$$

$$2(\cos 13x - 4 \cos x \cdot \cos^3(4x)) + 6 \cos((3x+5x)/2) \cdot \cos((3x-5x)/2) = 0$$

$$2(\cos 13x - 4 \cos x \cdot \cos^3(4x)) + 6 \cos(4x) \cdot \cos x = 0$$

$$2 \cos 13x - 8 \cos x \cdot \cos^3(4x) + 6 \cos(4x) \cdot \cos x = 0$$

$$2 \cos(4x) \cos x (-4 \cos^2(4x) + 3) + 2 \cos 13x = 0$$

$$\cos x \cdot \cos(4x) (-4 \cos^2(4x) + 3) + \cos 13x = 0$$

$$\cos x (3 \cos(4x) - 4 \cos^3(4x)) + \cos 13x = 0$$

$$\cos x \cdot \cos 12x - \cos 13x = 0$$

$$(1/2) \cdot (\cos(x+12x) + \cos(x-12x)) - \cos 13x = 0$$

$$\cos(13x) + \cos(11x) - 2 \cos 13x = 0$$

$$\cos(11x) - \cos 13x = 0$$

$$-2 \sin((11x+13x)/2) \cdot \sin((11x-13x)/2) = 0$$

$$\sin(12x) \cdot \sin x = 0$$

$$\sin(12x) = 0$$

$$12x = Pk$$

$$x = Pk/12$$

$$\sin x = 0$$

$$x = Pk$$

$$\text{Ответ: } Pk/12$$

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

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

$$\cos 3x = 4 \cos^3 x - 3 \cos x$$

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

$$\sin 2x \cdot \sin 6x \cdot \cos 4x + (1/4) \cdot \cos 12x = 0$$

$$4 \sin 2x \cdot \sin 6x \cdot \cos 4x + \cos 12x = 0$$

$$8(\cos(2x-6x) - \cos(2x+6x)) \cdot \cos 4x + \cos 12x = 0$$

$$8(\cos(-4x) - \cos(8x)) \cdot \cos 4x + \cos 12x = 0$$

$$8(\cos 4x - \cos 8x) \cdot \cos 4x + \cos 12x = 0$$

$$8 \cos^2(4x) - 8 \cos 8x \cdot \cos 4x + 4 \cos^3(4x) - 3 \cos 4x = 0$$

$$\cos(4x)(8 \cos(4x) - 8 \cos 8x + 4 \cos^2(4x) - 3) = 0$$

$$\cos(4x) = 0$$

$$8 \cos(4x) - 8 \cos 8x + 4 \cos^2(4x) - 3 = 0$$

$$4x = P/2 + Pk$$

$$8 \cos(4x) - 16 \cos^2(4x) + 4 \cos^2(4x) + 5 = 0$$

$$x = P/8 + Pk/4$$

$$\cos 4x = t$$

$$8t - 16t^2 + 4t^2 + 5 = 0$$

$$8t - 12t^2 + 5 = 0$$

$$12t^2 - 8t - 5 = 0$$

$$D = 64 + 240 = 304$$

$$t_1 = (8 + 4\sqrt{19})/24 = 4(2 + \sqrt{19})/24 = (2 + \sqrt{19})/6$$

$$t_2 = (8 - 4\sqrt{19})/24 = 4(2 - \sqrt{19})/24 = (2 - \sqrt{19})/6$$

$$\cos 4x = (2 - \sqrt{19})/6$$

$$4x = \arccos((2 - \sqrt{19})/6) + 2Pk$$

$$x = \arccos((2 - \sqrt{19})/6)/4 + Pk/2$$

$$4x = -\arccos((2 - \sqrt{19})/6) + 2Pk$$

$$x = -\arccos((2 - \sqrt{19})/6)/4 + Pk/2$$