

$$\sin x - \sin y = \frac{1}{2}$$
$$\cos x + \cos y = \frac{\sqrt{3}}{2}$$

$$2\cos\left(\frac{x+y}{2}\right) \sin\left(\frac{x-y}{2}\right) = \frac{1}{2}$$
$$2\cos\left(\frac{x+y}{2}\right) \cos\left(\frac{x-y}{2}\right) = \frac{\sqrt{3}}{2}$$
$$\sin\left(\frac{x-y}{2}\right) / \cos\left(\frac{x-y}{2}\right) = \frac{1}{\sqrt{3}}$$
$$\operatorname{tg}\left(\frac{x-y}{2}\right) = \frac{1}{\sqrt{3}}$$
$$\frac{x-y}{2} = \frac{\pi}{6} + \pi k$$
$$x-y = \frac{\pi}{3} + 2\pi k$$

1 случай

$$\frac{x-y}{2} = \frac{\pi}{6} + 2\pi k$$
$$\sin\left(\frac{x-y}{2}\right) = \frac{1}{2}$$
$$2\cos\left(\frac{x+y}{2}\right) \cdot \frac{1}{2} = \frac{1}{2}$$
$$\cos\left(\frac{x+y}{2}\right) = \frac{1}{2}$$
$$\frac{x+y}{2} = \pm \frac{\pi}{3} + 2\pi k$$

$$x+y = \pm \frac{\pi}{6} + 4\pi k$$
$$x-y = \frac{\pi}{3} + 2\pi n$$

$$x = \pm \frac{\pi}{12} + 2\pi k + \frac{\pi}{6} + \pi n$$
$$y = \pm \frac{\pi}{12} + 2\pi k - \frac{\pi}{6} - \pi n$$

2 случай

$$\frac{x-y}{2} = \frac{7\pi}{6} + 2\pi k$$
$$\sin\left(\frac{x-y}{2}\right) = -\frac{1}{2}$$
$$-2\cos\left(\frac{x+y}{2}\right) \cdot \frac{1}{2} = \frac{1}{2}$$
$$\cos\left(\frac{x+y}{2}\right) = -\frac{1}{2}$$
$$\frac{x+y}{2} = \pm \frac{2\pi}{3} + 2\pi k$$

$$x+y = \pm \frac{4\pi}{3} + 4\pi k$$
$$x-y = \frac{\pi}{3} + 2\pi n$$

$$x = \pm \frac{2\pi}{3} + 2\pi k + \frac{\pi}{6} + \pi n$$
$$x = \pm \frac{2\pi}{3} + 2\pi k - \frac{\pi}{6} - \pi n$$

Ответ

$$x = \pm \frac{\pi}{12} + 2\pi k + \frac{\pi}{6} + \pi n$$
$$y = \pm \frac{\pi}{12} + 2\pi k - \frac{\pi}{6} - \pi n$$
$$x = \pm \frac{2\pi}{3} + 2\pi k + \frac{\pi}{6} + \pi n$$
$$x = \pm \frac{2\pi}{3} + 2\pi k - \frac{\pi}{6} - \pi n$$