

$$\sin x \cdot \cos(x+y) + \sin(x+y) = 3\cos(x+y)$$

$$4\sin x = 5\operatorname{ctg}(x+y)$$

$$\sin x \cdot \cos(x+y) + \sin(x+y) = 3\cos(x+y) \quad : \sin(x+y)$$

$$\sin x \cdot \operatorname{ctg}(x+y) + 1 = 3 \operatorname{ctg}(x+y)$$

$$\sin x = a$$

$$\operatorname{ctg}(x+y) = b$$

$\sin(x+y) \neq 0$ - не равен

$$4\sin x = 5\operatorname{ctg}(x+y)$$

$$ab + 1 = 3b$$

$$4a = 5b$$

$$a = \frac{5}{4}b$$

$$\frac{5}{4}b^2 - 3b + 1 = 0$$

$$5b^2 - 12b + 4 = 0$$

$$D/4 = 4^2$$

$$b_1 = \frac{2}{5}$$

$$b_2 = 2$$

$$a_1 = \frac{5}{4} \cdot \frac{2}{5} = \frac{1}{2}$$

$$a_2 = \frac{5}{4} \cdot 2 = \frac{5}{2}$$

$$\sin x = \frac{1}{2}$$

$$x_1 = \frac{\pi}{6} + 2\pi k$$

$$x_2 = \frac{5\pi}{6} + 2\pi k$$

$\sin x = \frac{5}{2}$ - не существует

$$\operatorname{ctg}(x+y) = \frac{2}{5}$$

$$x+y = \operatorname{arccctg} \frac{2}{5} + \pi n$$

$$y_1 = \operatorname{arccctg} \frac{2}{5} + \pi n - \frac{\pi}{6} - 2\pi k$$

$$y_2 = \operatorname{arccctg} \frac{2}{5} + \pi n - \frac{\pi}{6} + 2\pi k$$

Ответ $(\frac{\pi}{6} + 2\pi k; \operatorname{arccctg} \frac{2}{5} + \pi n - \frac{\pi}{6} - 2\pi k)$

$(\frac{5\pi}{6} + 2\pi k; \operatorname{arccctg} \frac{2}{5} + \pi n - \frac{\pi}{6} + 2\pi k)$