

$$4\sin x + 2\cos x = 2 + 3\operatorname{tg} x$$

$$4\sin x + 2\cos x = 2 + 3\sin x / \cos x$$

$$4\sin x + 2\cos x - 2 - 3\sin x / \cos x = 0$$

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

$$[4\sin x \cdot \cos x + 2\cos^2(x) - 2\cos x - 3\sin x] / \cos x = 0$$

$$\cos x \neq 0$$

$$x \neq \pi/2 + \pi k$$

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

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

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

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

$$2\cos x(2\sin x - 1) + (2 + \sin x) - 2\sin x(\sin x + 2) = 0$$

$$(2 + \sin x)(1 - 2\sin x) + 2\cos x(2\sin x - 1) = 0$$

$$(2 + \sin x - 2\cos x)(1 - 2\sin x) = 0$$

$$2 + \sin x - 2\cos x = 0 \quad 1 - 2\sin x = 0$$

$$2\sin x = 1$$

$$\sin x = 1/2$$

$$x = \pi/6 + 2\pi k$$

$$x = \pi - \pi/6 + 2\pi k$$

1 СПОСОБ

$$2 + \sin x - 2\cos x = 0$$

$$2 + \sqrt{1+4}[\sin x \cdot 1/\sqrt{5} - \cos x \cdot 2/\sqrt{5}] = 0$$

$$\cos t = 1/\sqrt{5}$$

$$\sin t = -2/\sqrt{5}$$

$$t = -\arccos(1/\sqrt{5})$$

$$2 + \sqrt{1+4}[\sin x \cdot \cos t + \cos x \cdot \sin t] = 0$$

$$2 + \sqrt{5} \cdot \sin(x+t) = 0$$

$$\sin(x+t) = -2/\sqrt{5}$$

$$x+t = \arcsin(-2/\sqrt{5}) + 2\pi k$$

$$x+t = \pi - \arcsin(-2/\sqrt{5}) + 2\pi k$$

$$x = \arcsin(-2/\sqrt{5}) + \arccos(1/\sqrt{5}) + 2\pi k$$

$$x = \pi - \arcsin(-2/\sqrt{5}) + \arccos(1/\sqrt{5}) + 2\pi k$$

Ответ: $\pi/6 + 2\pi k; 5\pi/6 + 2\pi k;$
 $\arcsin(-2/\sqrt{5}) + \arccos(1/\sqrt{5}) + 2\pi k$
 $\pi - \arcsin(-2/\sqrt{5}) + \arccos(1/\sqrt{5}) + 2\pi k$

2 СПОСОБ

$$2 + \sin x - 2\cos x = 0$$

$$2 + 2\sin(x/2)\cos(x/2) - 2(1 - 2\sin^2(x/2)) = 0$$

$$2 + 2\sin(x/2)\cos(x/2) - 2 + 4\sin^2(x/2) = 0$$

$$2\sin(x/2)\cos(x/2) + 4\sin^2(x/2) = 0$$

$$2\sin(x/2)(\cos(x/2) + 2\sin(x/2)) = 0$$

$$2\sin(x/2) = 0 \quad \cos(x/2) + 2\sin(x/2) = 0$$

$$\sin(x/2) = 0 \quad 1 + 2\operatorname{tg}(x/2) = 0$$

$$x/2 = \pi k \quad 2\operatorname{tg}(x/2) = -1$$

$$x = 2\pi k \quad \operatorname{tg}(x/2) = -1/2$$

$$x/2 = \operatorname{arctg}(-1/2) + \pi k$$

$$x = 2\operatorname{arctg}(-1/2) + 2\pi k$$

Ответ: $\pi/6 + 2\pi k; 5\pi/6 + 2\pi k;$
 $2\operatorname{arctg}(-1/2) + 2\pi k$
 $2\pi k$

