

1.

$$2 \sin x = -1$$

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

$$x = (-1)^k \cdot \arcsin\left(-\frac{1}{2}\right) + \pi k, \quad k \in Z$$

$$x = (-1)^k \cdot \frac{7\pi}{6} + \pi k$$

$$\text{Ответ: } (-1)^k \cdot \frac{7\pi}{6} + \pi k, \quad k \in Z$$

2.

$$\sin \pi x = 1$$

$$\pi x = \frac{\pi}{2} + 2\pi k, \quad k \in Z$$

$$x = \frac{1}{2} + 2k$$

$$\text{Ответ: } \frac{1}{2} + 2k, \quad k \in Z$$

3.

$$2 \cos 2x = -\sqrt{2}$$

$$\cos 2x = -\frac{\sqrt{2}}{2}$$

$$2x = \pm \arccos\left(-\frac{\sqrt{2}}{2}\right) + 2\pi k, \quad k \in Z$$

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

$$x = \pm \frac{3\pi}{8} + \pi k$$

$$\text{Ответ: } x = \pm \frac{3\pi}{8} + \pi k, \quad k \in Z$$

4.

$$\sqrt{3} \operatorname{tg}\left(x + \frac{\pi}{6}\right) = 1$$

$$\operatorname{tg}\left(x + \frac{\pi}{6}\right) = \frac{1}{\sqrt{3}}$$

$$x + \frac{\pi}{6} = \operatorname{arctg} \frac{1}{\sqrt{3}} + \pi k, \quad k \in Z$$

$$x + \frac{\pi}{6} = \frac{\pi}{6} + \pi k$$

$$x = \pi k$$

$$\text{Ответ: } \pi k, \quad k \in Z$$

5.

$$(\operatorname{ctg} x)^{100} = 1$$

$$\operatorname{ctg} x = \pm 1$$

$$x = \operatorname{arccctg}(\pm 1) + \pi k, \quad k \in Z$$

$$x_1 = \frac{\pi}{4} + \pi k$$

$$x_2 = \frac{5\pi}{4} + \pi k$$

Оба решения совпадают.

Ответ: $\frac{\pi}{4} + \pi k, \quad k \in Z$

6.

$$\sin^2 x - \sin x = 0$$

$$\sin x (\sin x - 1) = 0$$

a) $\sin x = 0$

$$x = \pi k, \quad k \in Z$$

b) $\sin x = 1$

$$x = \frac{\pi}{2} + 2\pi n, \quad n \in Z$$

Ответ: $\pi k, \quad k \in Z; \quad \frac{\pi}{2} + 2\pi n, \quad n \in Z$