

Equations of the form $\sin(x) = b$

№1. Solve the following equations:

$$1. \quad \sin\left(x - \frac{\pi}{6}\right) = \frac{\sqrt{2}}{2};$$

$$3. \quad \sin\left(\frac{x}{3} + 1\right) = -1;$$

$$2. \quad \sin\left(\frac{\pi}{8} - x\right) = \frac{\sqrt{3}}{2};$$

$$4. \quad \sqrt{2} \sin\left(\frac{\pi}{12} - 3x\right) - 1 = 0.$$

№2. Find the smallest positive root of the equation $\sin\left(x + \frac{\pi}{4}\right) = -\frac{\sqrt{3}}{2}$.

№3. Find all roots of the equation $\sin\left(x - \frac{\pi}{3}\right) = \frac{1}{2}$ which belong to an interval $\left[-\pi; \frac{3\pi}{2}\right]$.

№4. Solve the following equations:

$$1. \quad \sqrt{3} \sin x + \cos x = 2;$$

$$3. \quad 3 \sin \frac{x}{2} + \sqrt{3} \cos \frac{x}{2} = 3.$$

$$2. \quad \sqrt{2} \sin x - \sqrt{2} \cos x = 1;$$

№5. Solve the following equations:

$$1. \quad \sin \frac{2}{x} = 0;$$

$$2. \quad \sin \pi \sqrt{x} = -1;$$

$$3. \quad \sin(\cos x) = \frac{1}{2}.$$