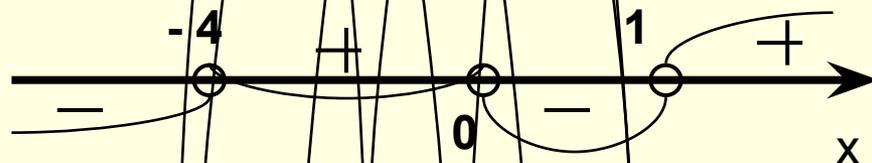


Решение тригонометрических неравенств методом интервалов

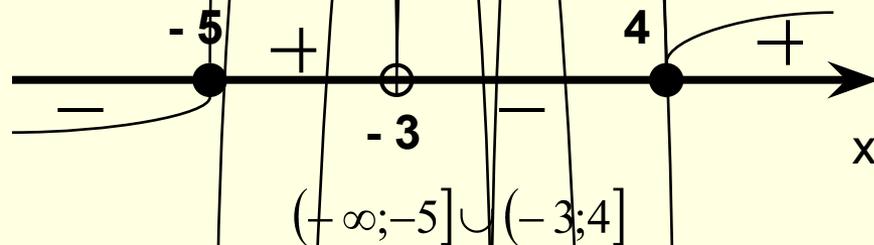
Райкова Лидия Викторовна,
учитель математики МОУ «СОШ №8»

Проверка домашнего задания

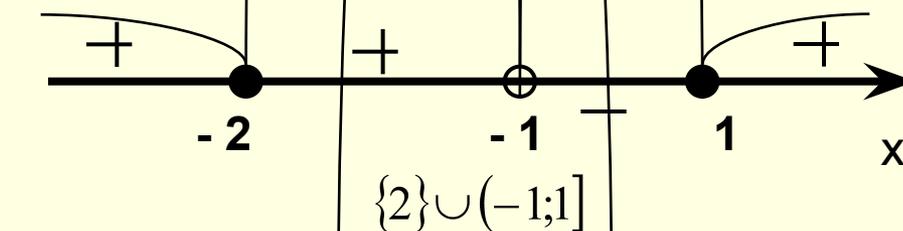
$$x(x+1)(x-1) < 0$$



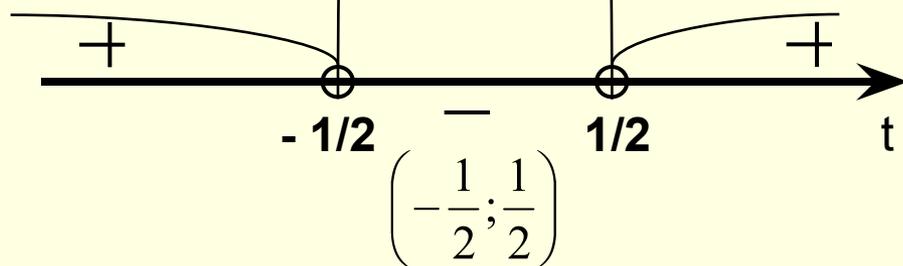
$$\frac{(4-x)(x+5)}{x+3} \geq 0$$



$$\frac{(x-1)(x+2)^2}{x+1} \leq 0$$



$$4t^2 < 0$$



Устная работа

$$f(x) = \sin x \cdot x^2$$

$$f(x) = \frac{\cos^2 x}{\sin x}$$

$$f(x) = \cos x \cdot (\cos x + 1)$$

$$f(x) = \frac{\sin x - 1}{\cos x}$$

$$f(x) = \frac{\cos 2x}{x - 3}$$

I способ – обычный

$$4 \cos^2 x < 1$$

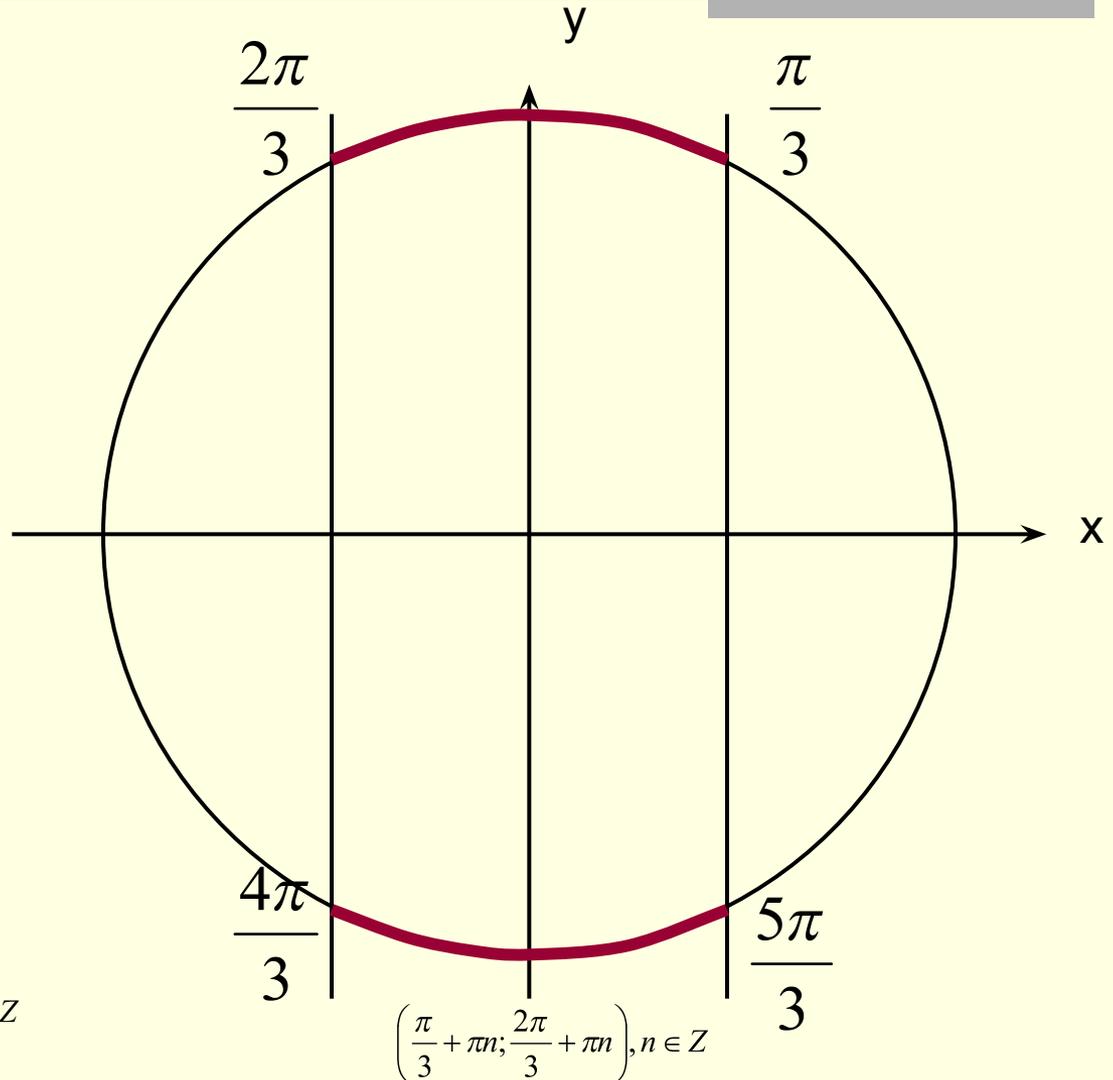
$$\cos^2 x < \frac{1}{4}$$

$$|\cos x| < \frac{1}{2}$$

$$\left\{ \begin{array}{l} \cos x < \frac{1}{2} \\ \cos x > -\frac{1}{2} \end{array} \right.$$

$$\left\{ \begin{array}{l} \cos x < \frac{1}{2} \\ \cos x > -\frac{1}{2} \end{array} \right.$$

$$x \in \left(\frac{\pi}{3} + 2\pi n; \frac{2\pi}{3} + 2\pi n \right) \cup \left(\frac{4\pi}{3} + 2\pi n; \frac{5\pi}{3} + 2\pi n \right), n \in \mathbb{Z}$$



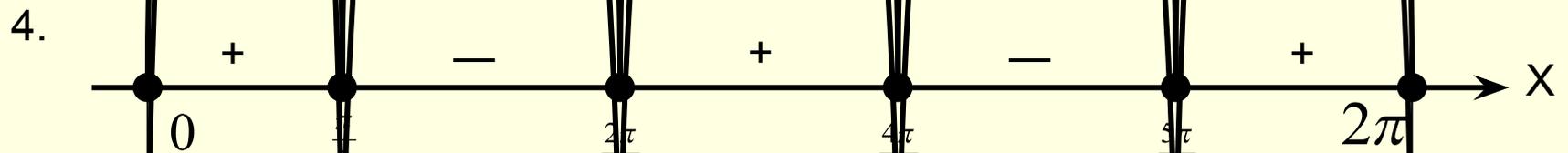
$$\left(\frac{\pi}{3} + \pi n; \frac{2\pi}{3} + \pi n \right), n \in \mathbb{Z}$$

II способ – метод интервалов

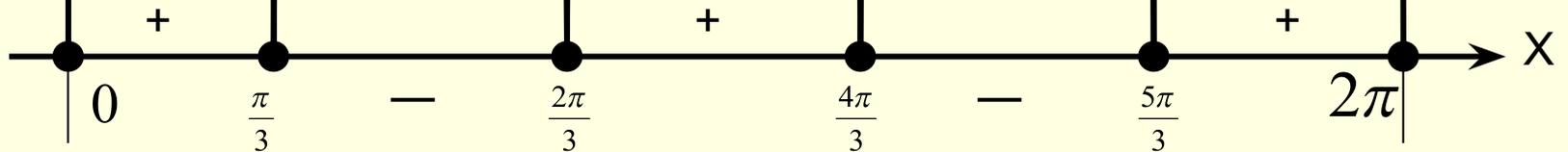
$$4 \cos^2 x - 1 < 0$$

1. Пусть $f(x) = (2 \cos x - 1)(2 \cos x + 1)$ 2. $D(f) = (-\infty; \infty)$

3.
$$\begin{cases} 2 \cos x - 1 = 0 \\ 2 \cos x + 1 = 0 \end{cases} \quad \begin{cases} \cos x = 1/2 \\ \cos x = -1/2 \end{cases} \quad x = \frac{\pi}{3}; x = \frac{2\pi}{3}; x = \frac{4\pi}{3}; x = \frac{5\pi}{3};$$



ИЛИ

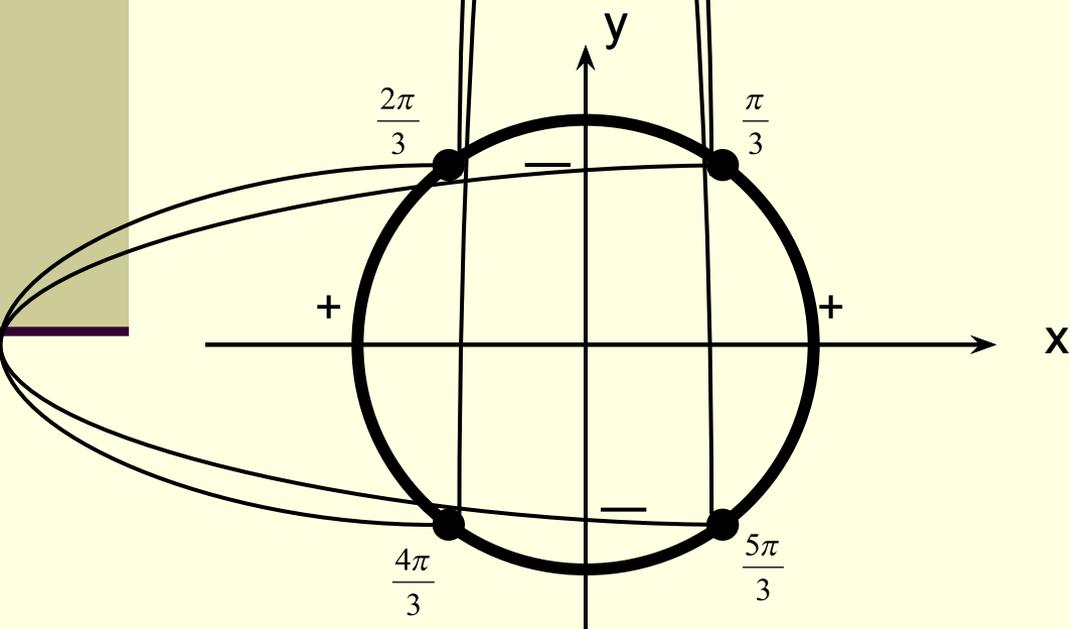
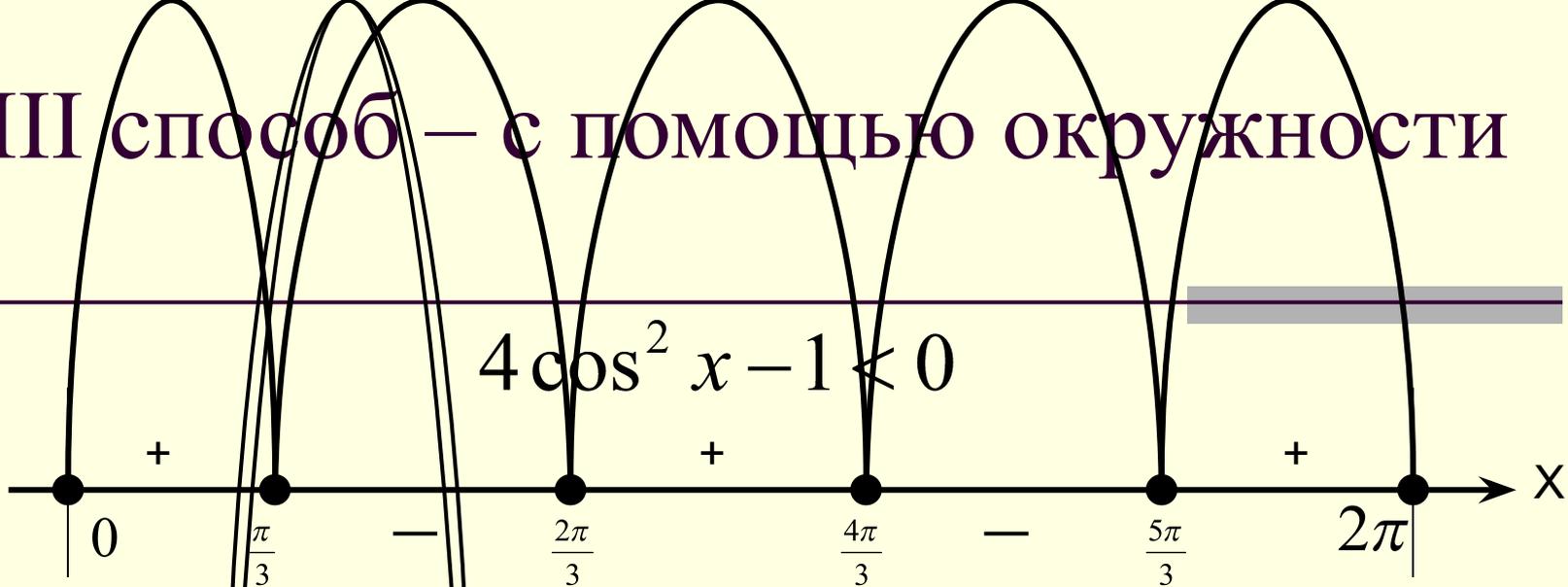


$$x \in \left(\frac{\pi}{3} + 2\pi n; \frac{2\pi}{3} + 2\pi n \right) \cup \left(\frac{4\pi}{3} + 2\pi n; \frac{5\pi}{3} + 2\pi n \right), n \in Z$$

$$\left(\frac{\pi}{3} + \pi n; \frac{2\pi}{3} + \pi n \right), n \in Z$$

III способ – с помощью окружности

$$4 \cos^2 x - 1 \leq 0$$



$$\left(\frac{\pi}{3} + \pi n; \frac{2\pi}{3} + \pi n \right), n \in Z$$

Пример 1.

$$\frac{\sin 3x \cdot \sin x}{\cos x \cdot \sin 2x} > 0$$

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

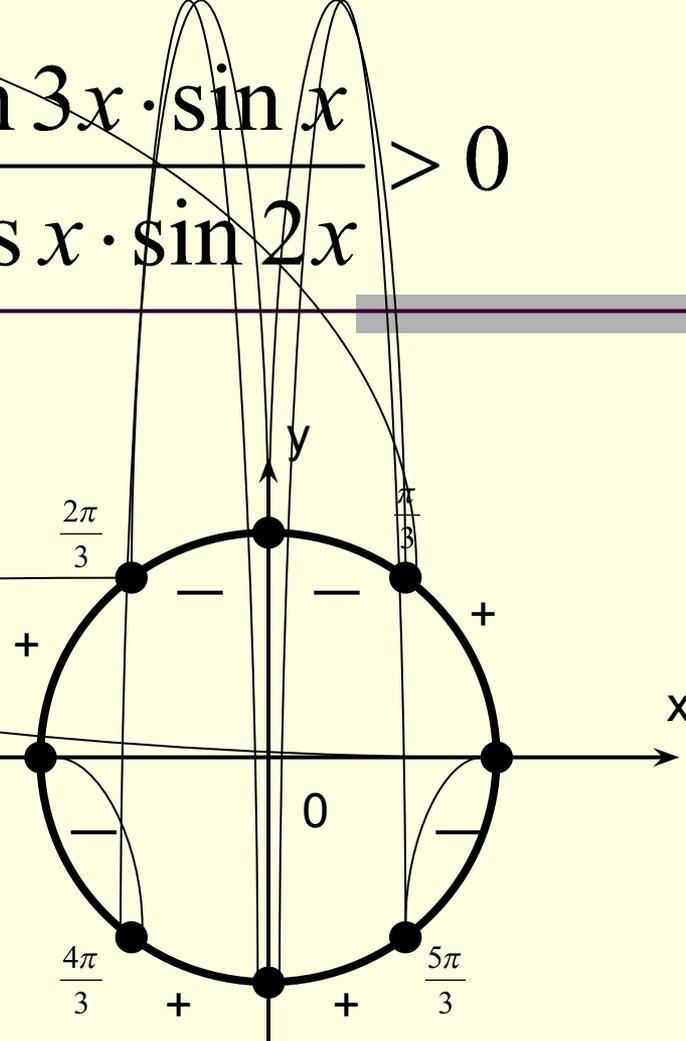
2. $D(f):$ $\begin{cases} \cos x \neq 0 \\ \sin 2x \neq 0 \end{cases} \begin{cases} x \neq \pi/2 + \pi n \\ x \neq \pi n/2, n \in \mathbb{Z} \end{cases}$

$$\begin{cases} x \neq \pi/2 \\ x \neq 0 \end{cases} \begin{cases} x \neq 3\pi/2 \\ x \neq \pi/2 \end{cases} \begin{cases} x \neq 3\pi/2 \\ x \neq \pi \end{cases}$$

3. Нули функции:

$$\begin{cases} \sin x = 0 \\ \sin 3x = 0 \end{cases} \begin{cases} x = \pi n \\ x = \pi n/3, n \in \mathbb{Z} \end{cases} \begin{cases} x = 0 \\ x = 0 \end{cases}$$

$$\begin{cases} x = \pi \\ x = \pi/3; x = 2\pi/3; x \neq \pi; x = 4\pi/3; x = 5\pi/3 \end{cases}$$



Домашнее задание

$$2 \sin^2 x < 1 \quad (\text{двумя способами})$$

$$\frac{2 \sin x - \sqrt{3}}{\sin x}$$

$$(2 \cos x - \sqrt{2}) < 0$$

$$\frac{\sin x \cdot \sin 3x}{\cos x \cdot \sin 2x} < 0$$

Благодарю за внимание!

