

**Построение графиков  
тригонометрических  
функций  
с помощью  
преобразований**

$$E = m \cdot c^2$$

## Цели урока:

- ✓ повторить построение графиков функций  $y=f(x)+a$ ,  $y=kf(x)$ ,  $y=f(x+b)$  на примере построения графиков тригонометрических функций;
- ✓ рассмотреть преобразование  $y=f(kx)$  при построении графиков тригонометрических функций;
- ✓ прививать интерес к математике;
- ✓ воспитывать графическую культуру, умение видеть красоту математики.


$$E=mc^2$$



## План урока:

1. Построение графиков с помощью преобразования  
 $y=f(x)+a$
2. Построение графиков с помощью преобразования  
 $y=kf(x)$
3. Построение графиков с помощью преобразования  
 $y=f(x+b)$
4. Построение графиков с помощью преобразования  
 $y=f(kx)$
5. Построение графиков с помощью преобразований.
6. Практическая работа.

$$E=mc^2$$



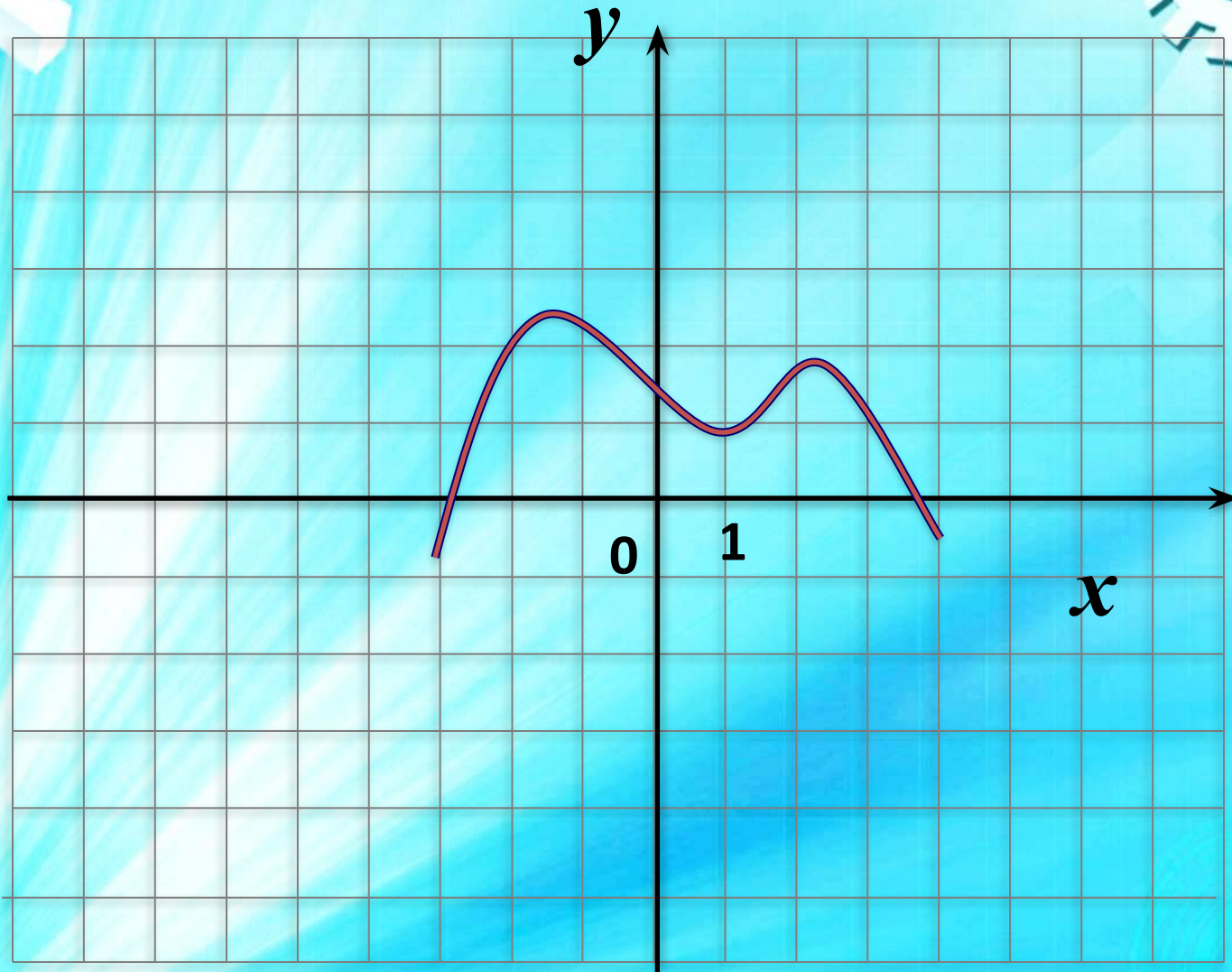
Построение  
графиков  
с помощью  
преобразования

$$Y=f(x)+a$$

$$E=mc^2$$



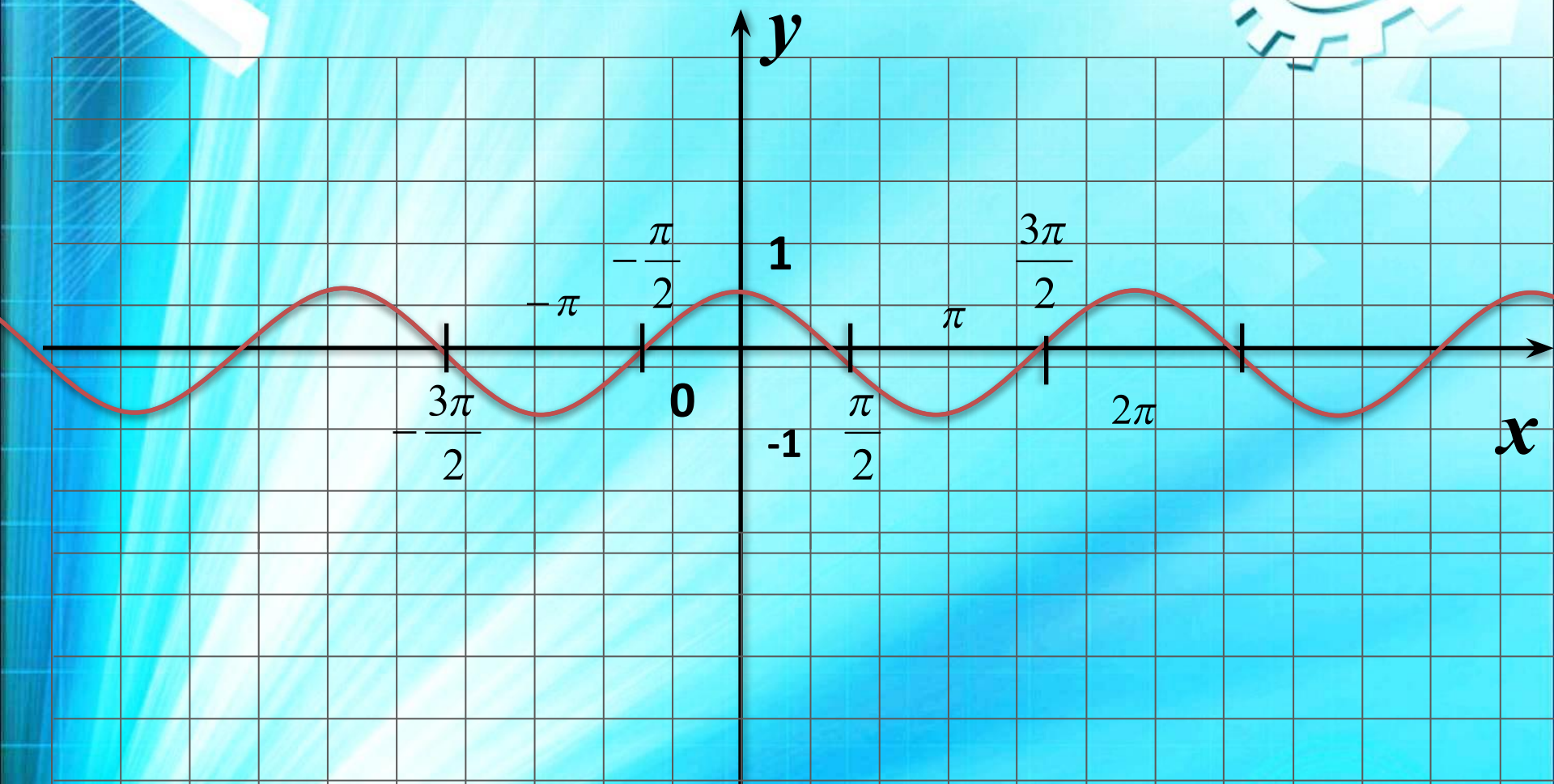
$$Y=f(x)+a$$



$$E=m \cdot c^2$$

$$Y = \cos x - 3$$

$$Y = \cos x - 3$$

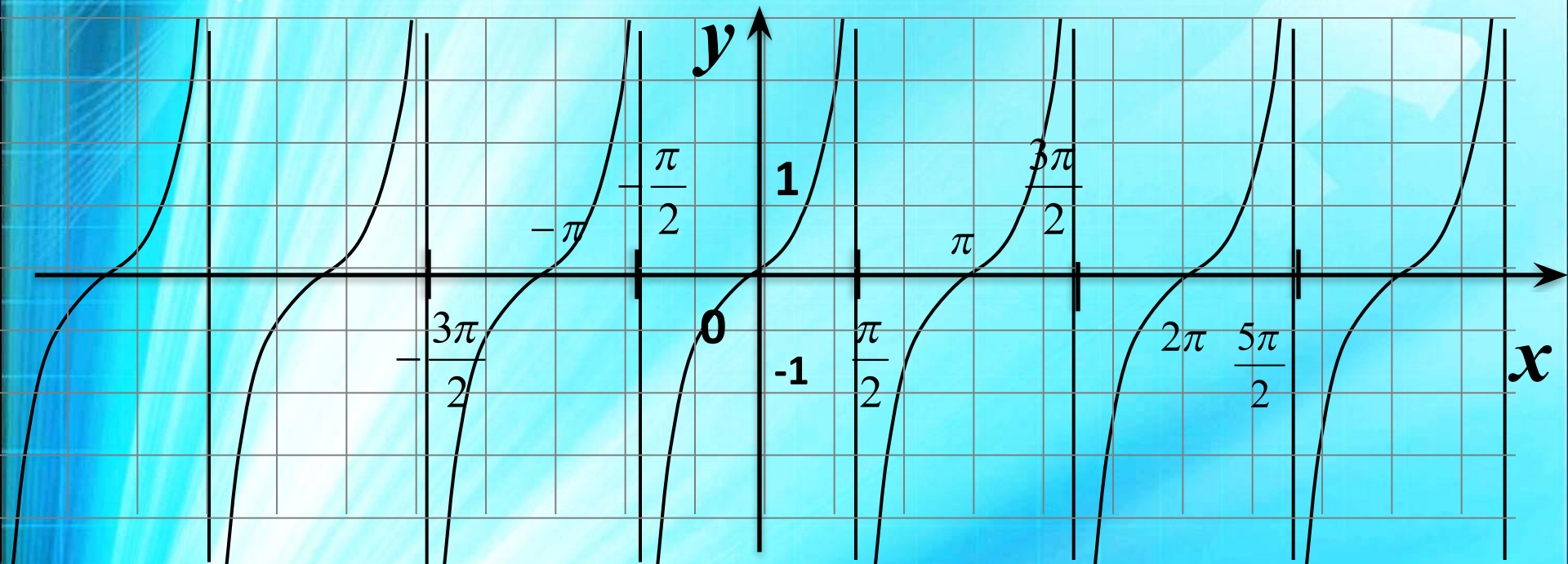


$$E = m \cdot c^2$$



$$Y = \text{tg}x + 1$$

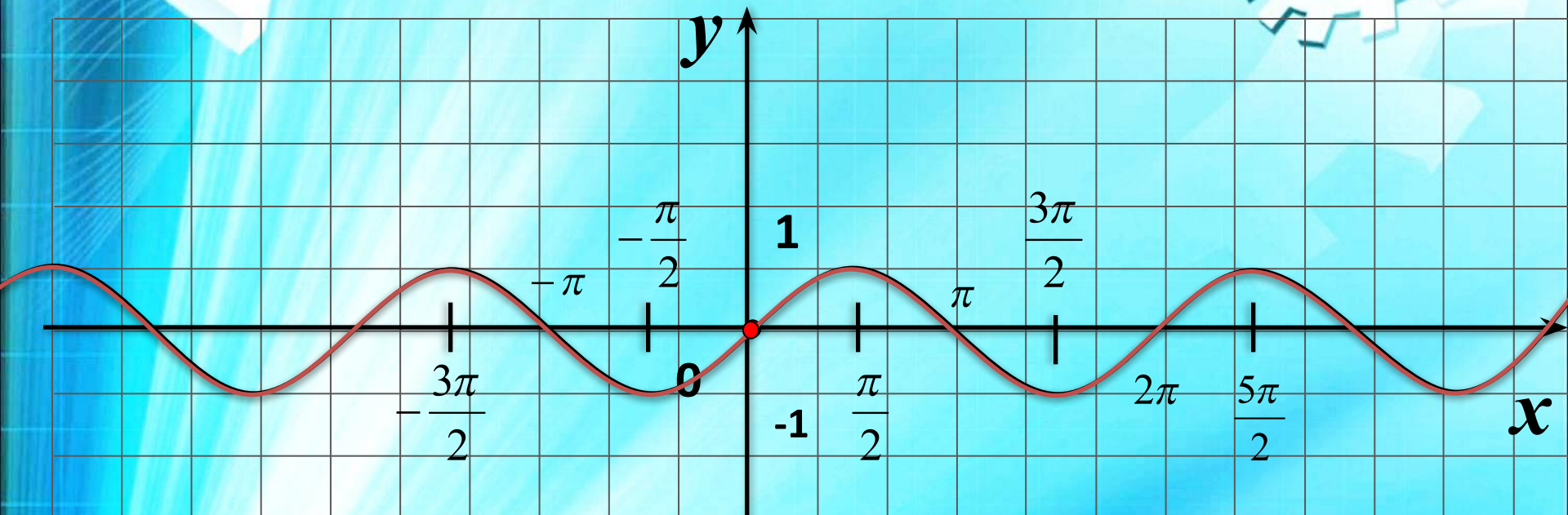
$$Y = \text{tg}x + 1$$



$$E = m \cdot c^2$$


$$Y = \sin X - 2$$

$$Y = \sin X - 2$$



$$E = m \cdot c^2$$

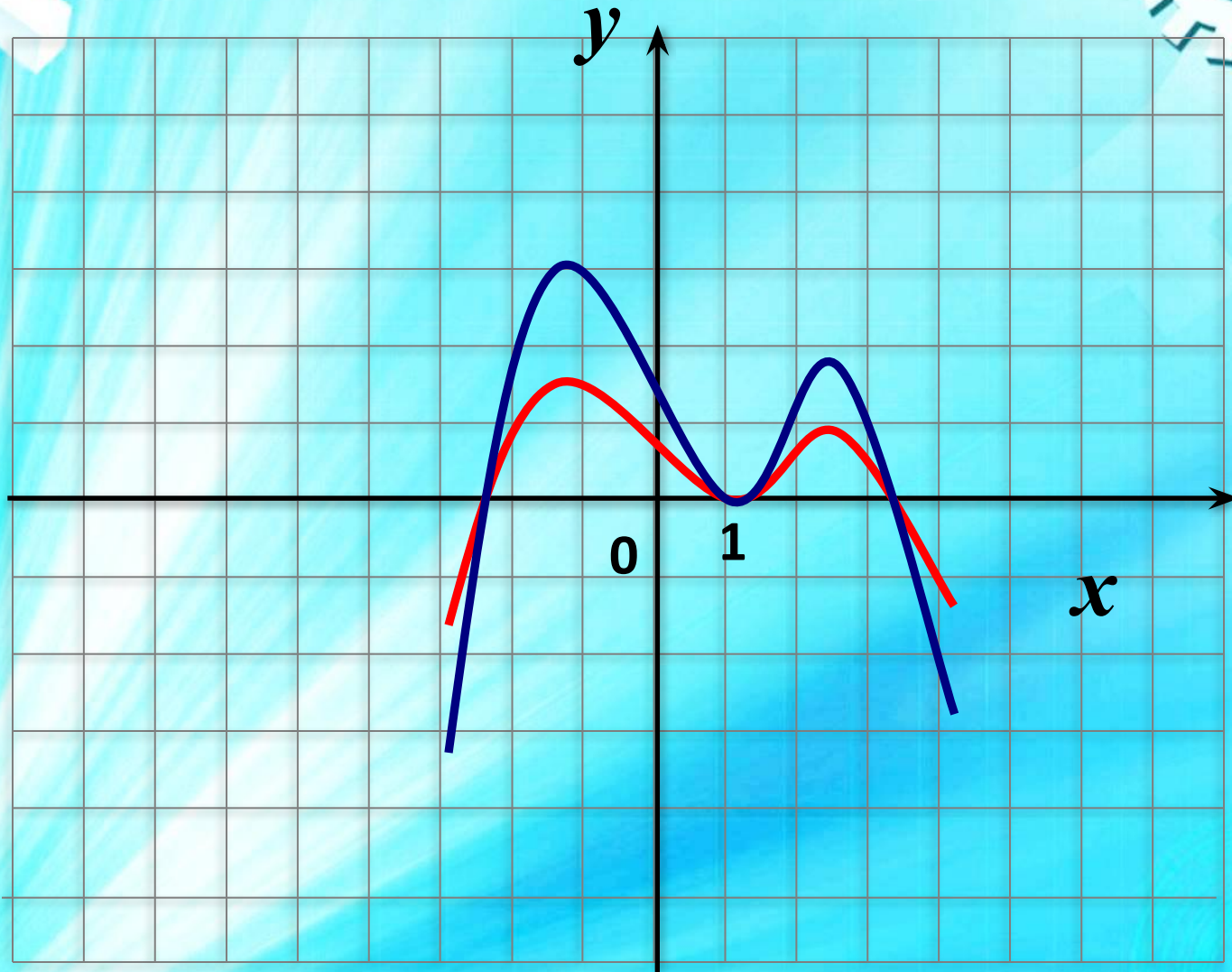




Построение  
графиков  
с помощью  
преобразования  
 $Y=kf(x)$

$$E=mc^2$$

$$Y=f(g(x))$$

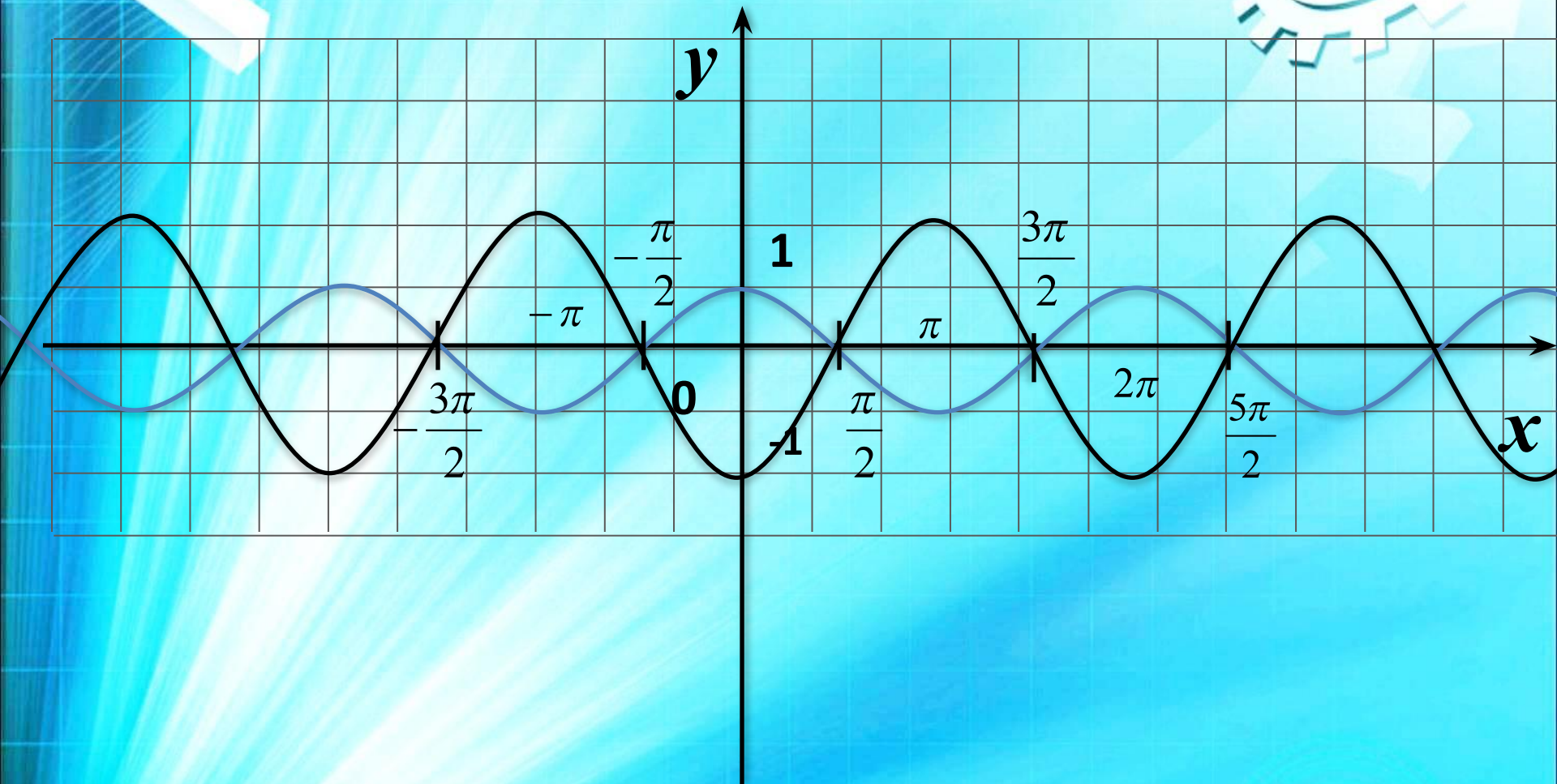


$$E=m \cdot c^2$$



$$Y = -2 \cos x$$

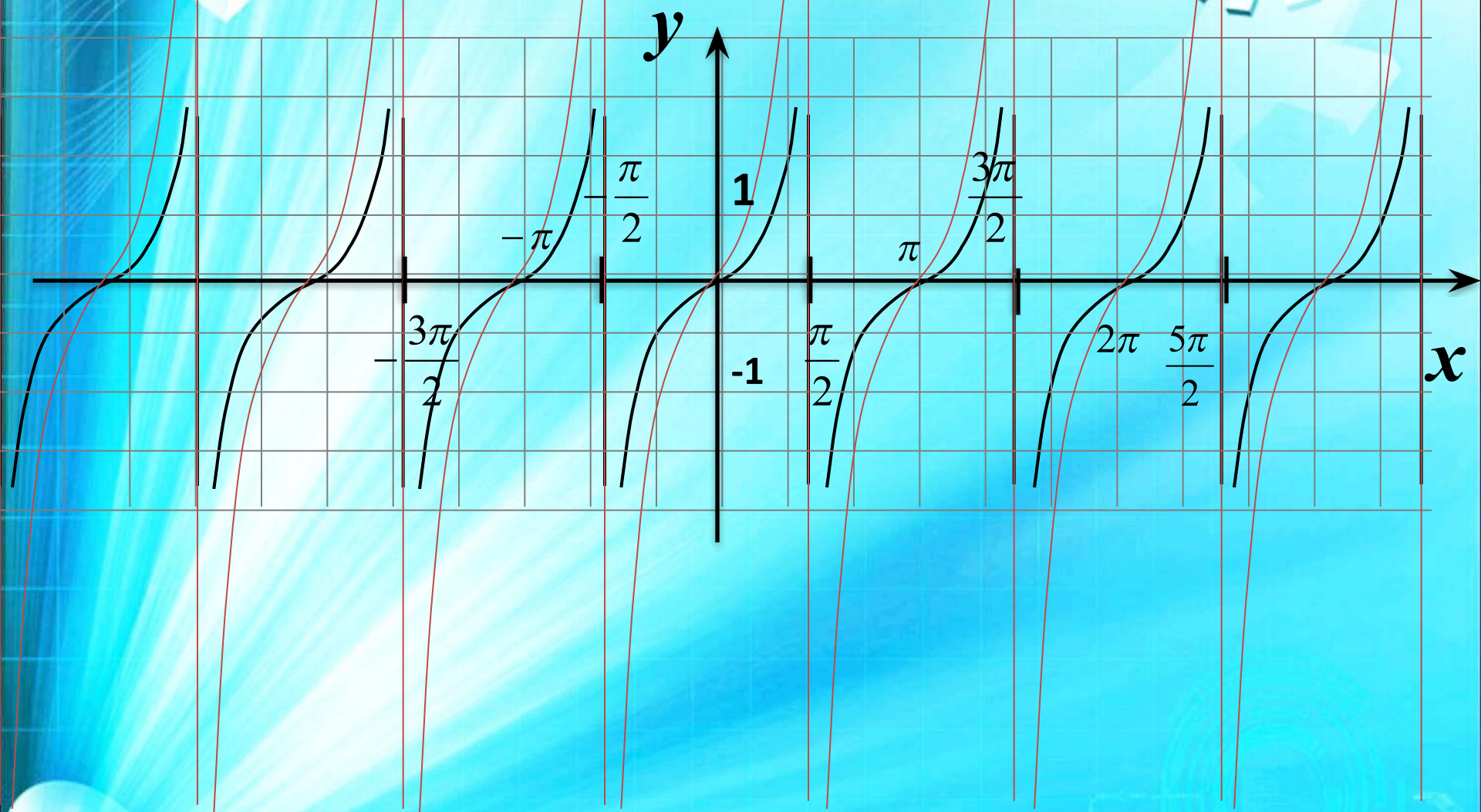
$$Y = \epsilon \sin x$$



$$E = m \cdot c^2$$

$$Y = 3 \operatorname{tg} x$$

$$Y = \operatorname{tg} x$$

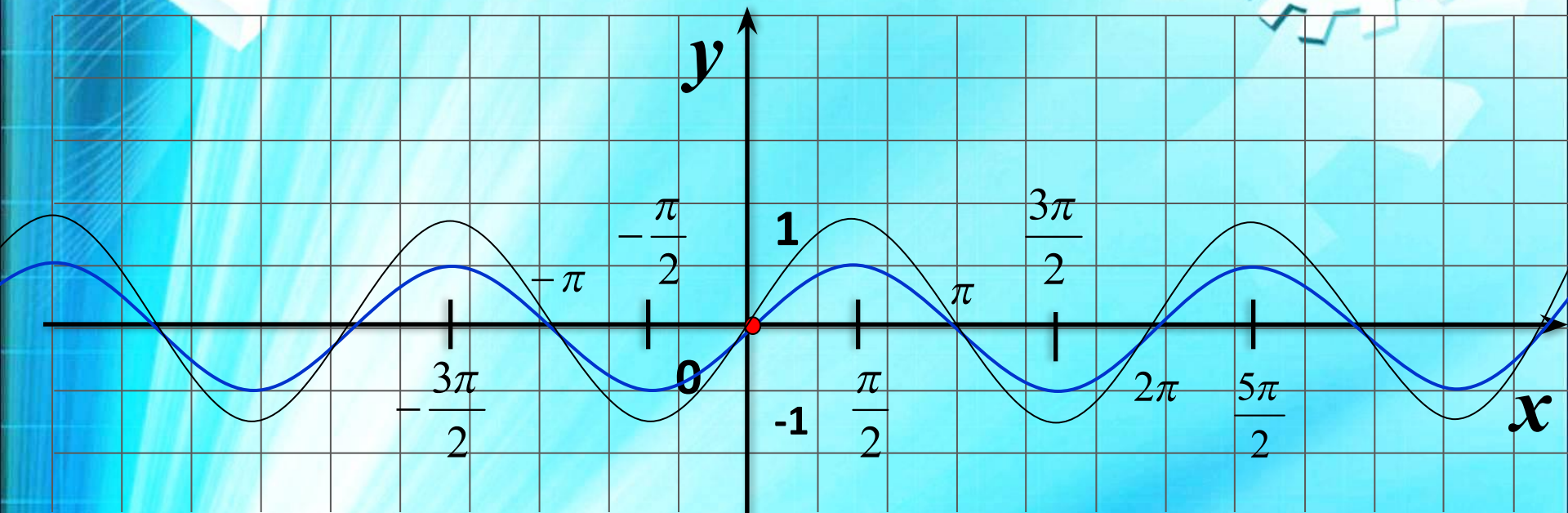


$$E = m \cdot c^2$$




$$Y = 1,5 \sin x$$

$$Y = 1,5 \sin x$$



$$E = m \cdot c^2$$

The background is a vibrant blue with a subtle grid pattern. In the top right corner, there is a large, semi-transparent gear. In the top left, there are some abstract, glowing geometric shapes. A bright light beam originates from the bottom left corner, radiating upwards and to the right. In the bottom right corner, the equation  $E=mc^2$  is faintly visible.

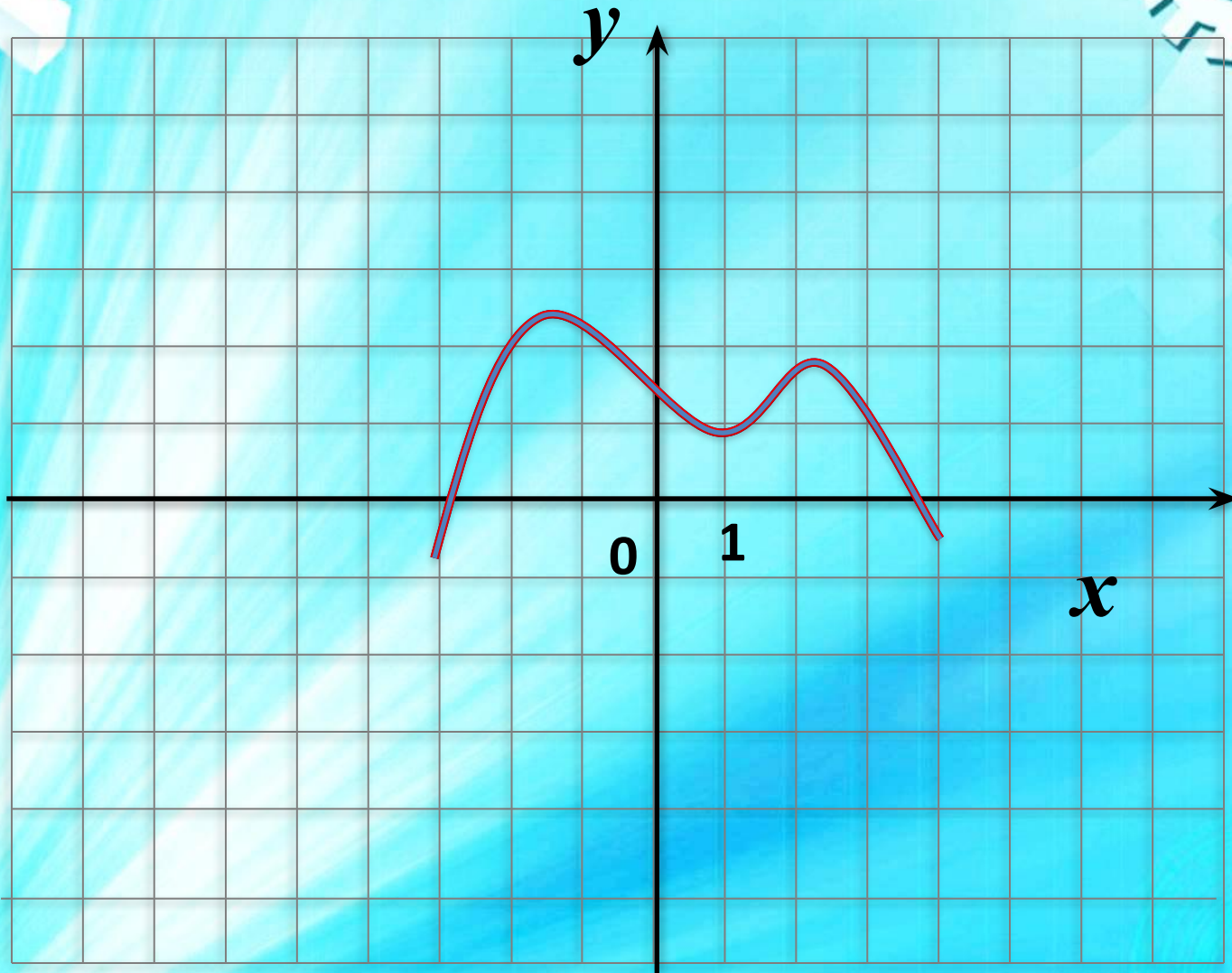
Построение  
графиков  
с помощью  
преобразования

$$Y=f(x+b)$$

$$E=mc^2$$



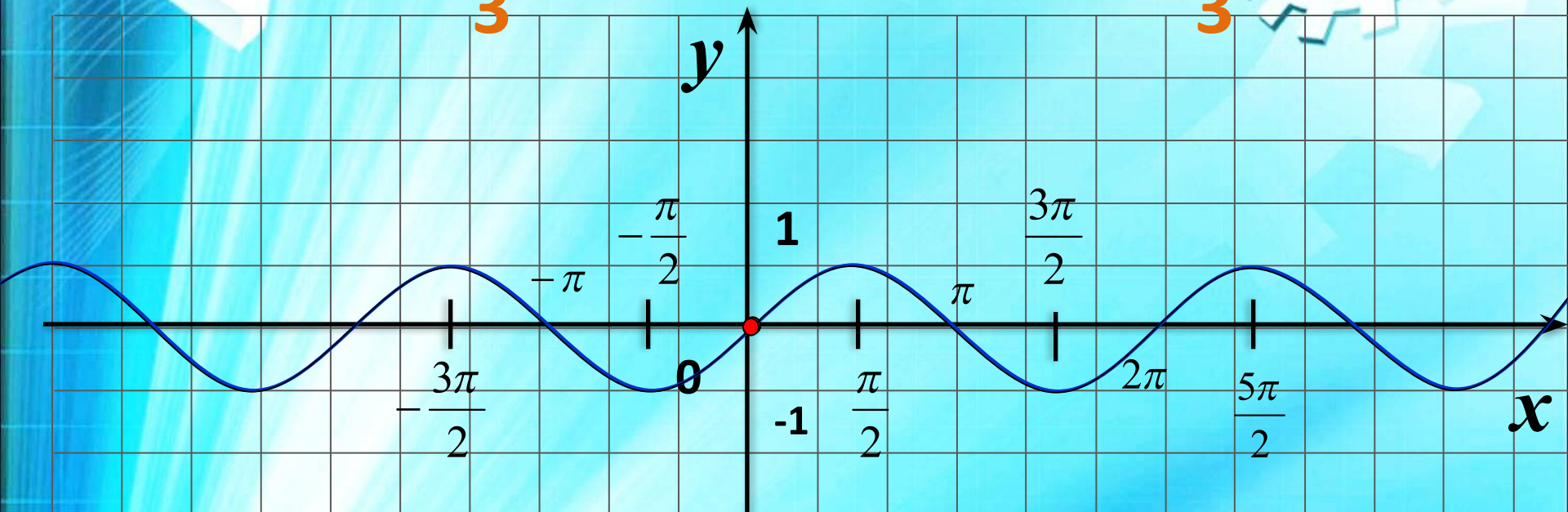
$$Y=f(x)+b$$



$$E=m \cdot c^2$$

$$y = \sin\left(x + \frac{\pi}{3}\right)$$

$$y = \sin\left(x + \frac{\pi}{3}\right)$$

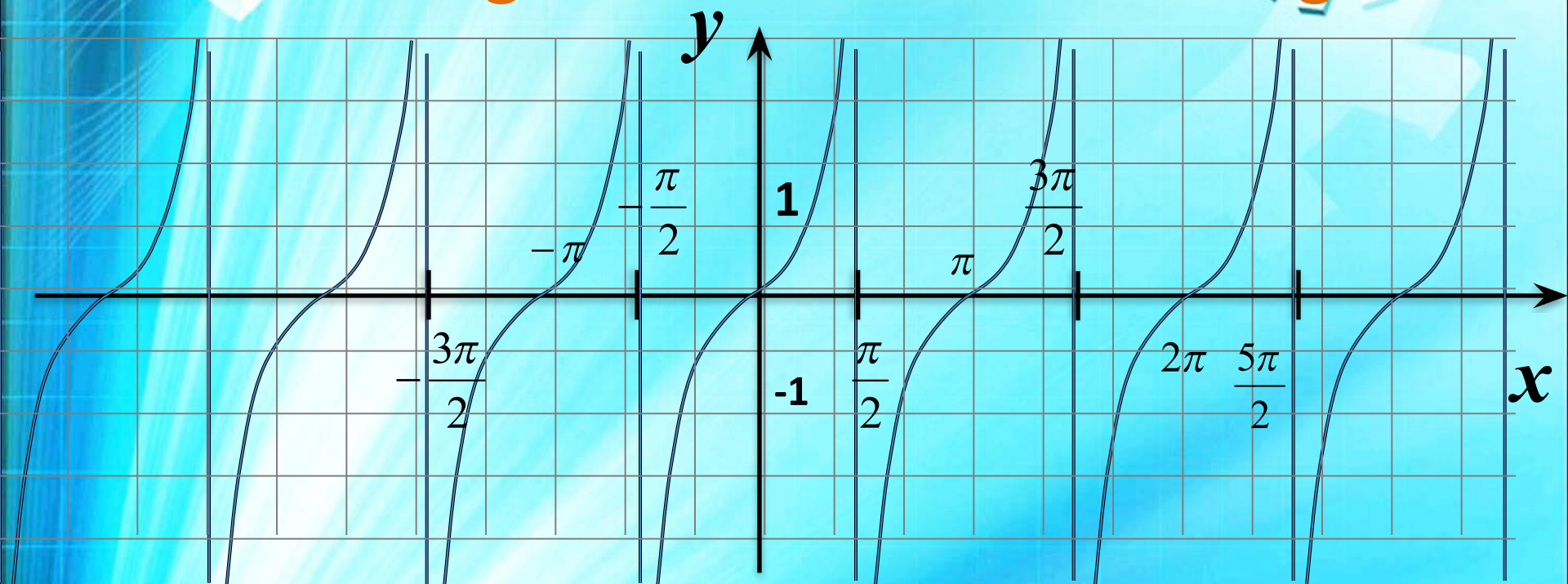


$$E = m \cdot c^2$$



$$y = \operatorname{tg}\left(x - \frac{\pi}{3}\right)$$

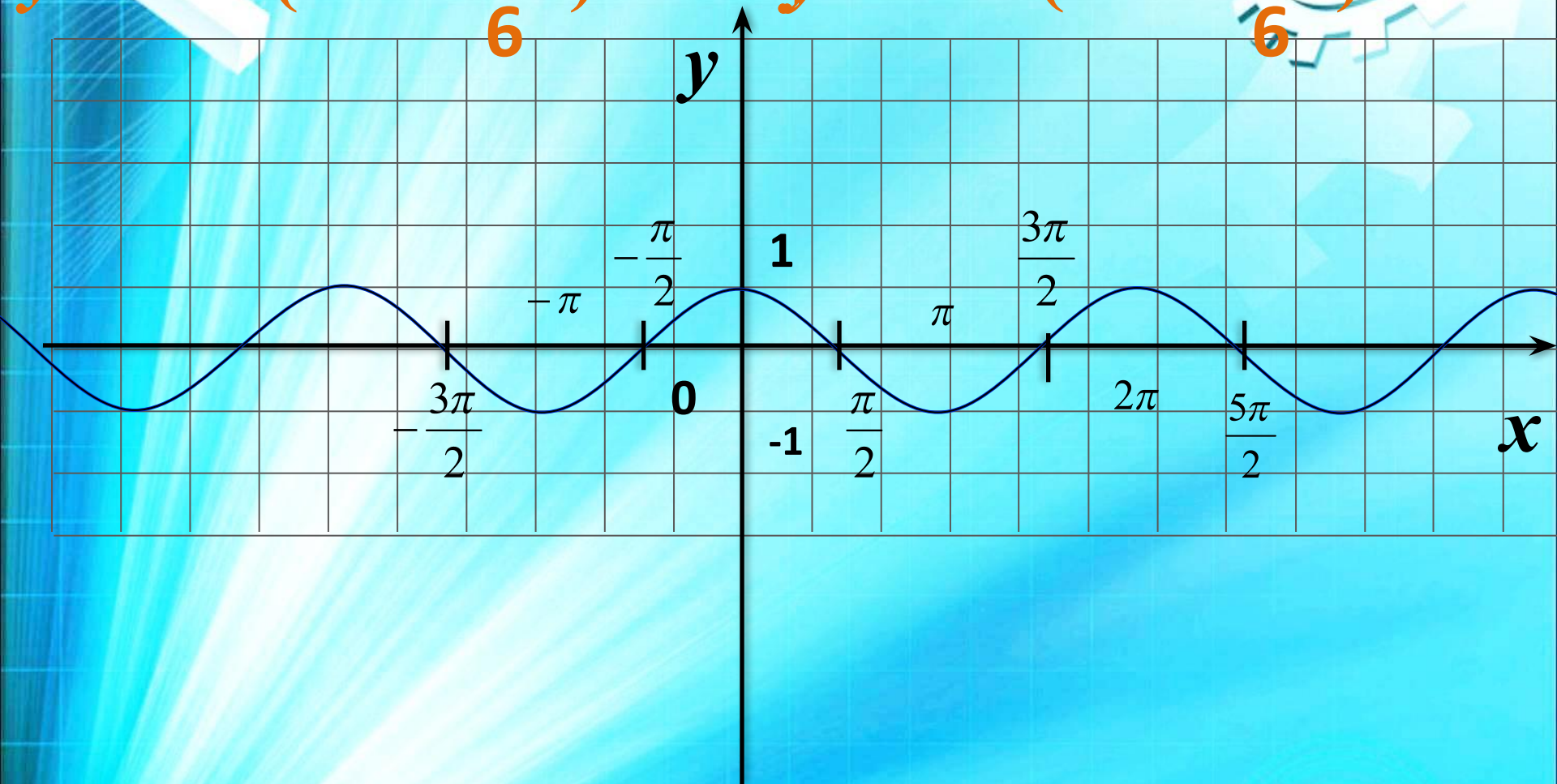
$$y = \operatorname{tg}\left(x - \frac{\pi}{3}\right)$$



$$E = m \cdot c^2$$


$$y = \cos\left(x - \frac{\pi}{6}\right)$$

$$y = \cos\left(x - \frac{\pi}{6}\right)$$



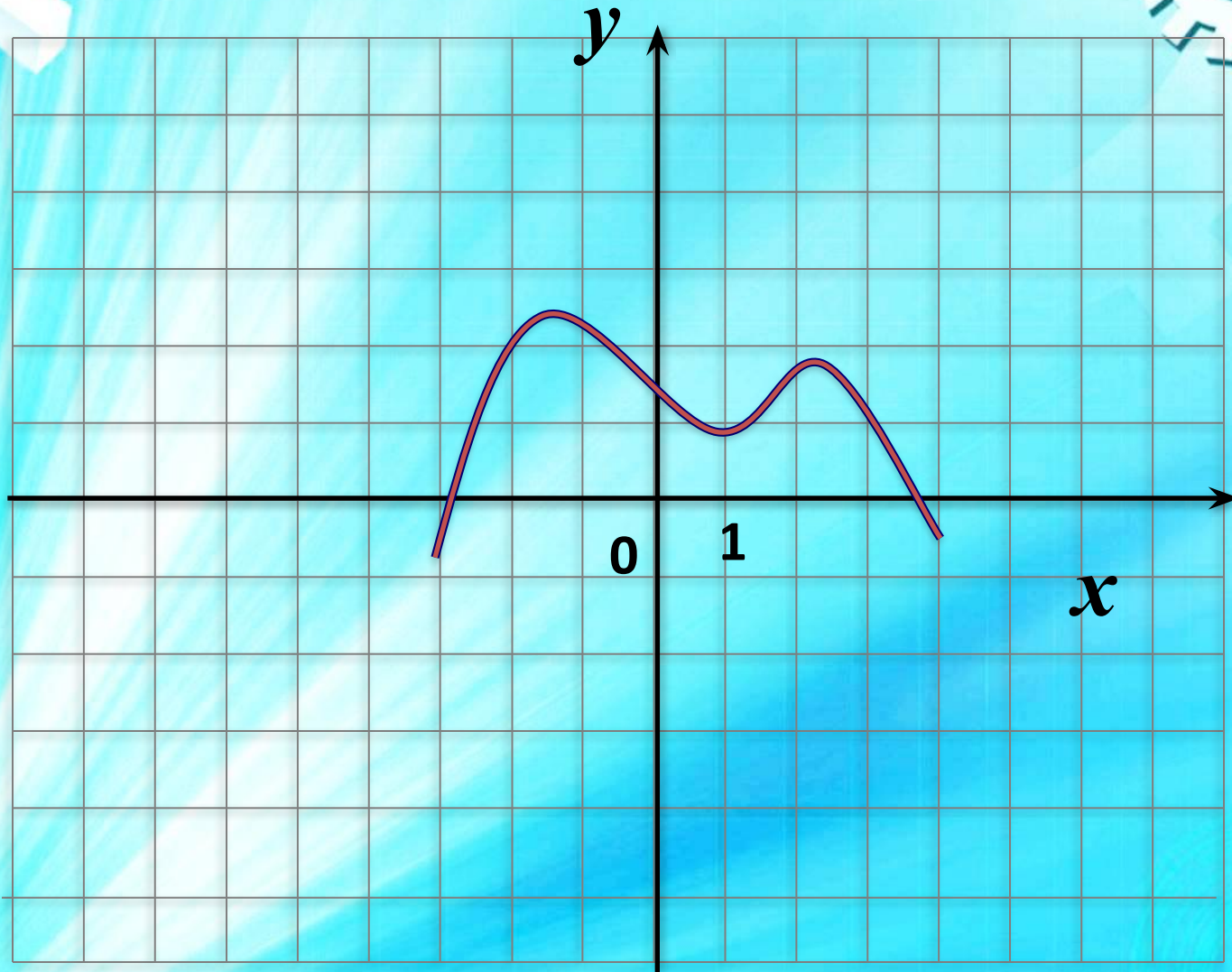
$$E = m \cdot c^2$$



The background is a vibrant blue with a subtle grid pattern. In the top right corner, there is a large, semi-transparent gear. In the bottom right corner, the equation  $E=mc^2$  is displayed in a glowing, semi-transparent font. The main text is centered and rendered in a bold, white, sans-serif font.

Построение  
графиков  
с помощью  
преобразования  
 $Y=f(kx)$

$$Y=f(kx)$$

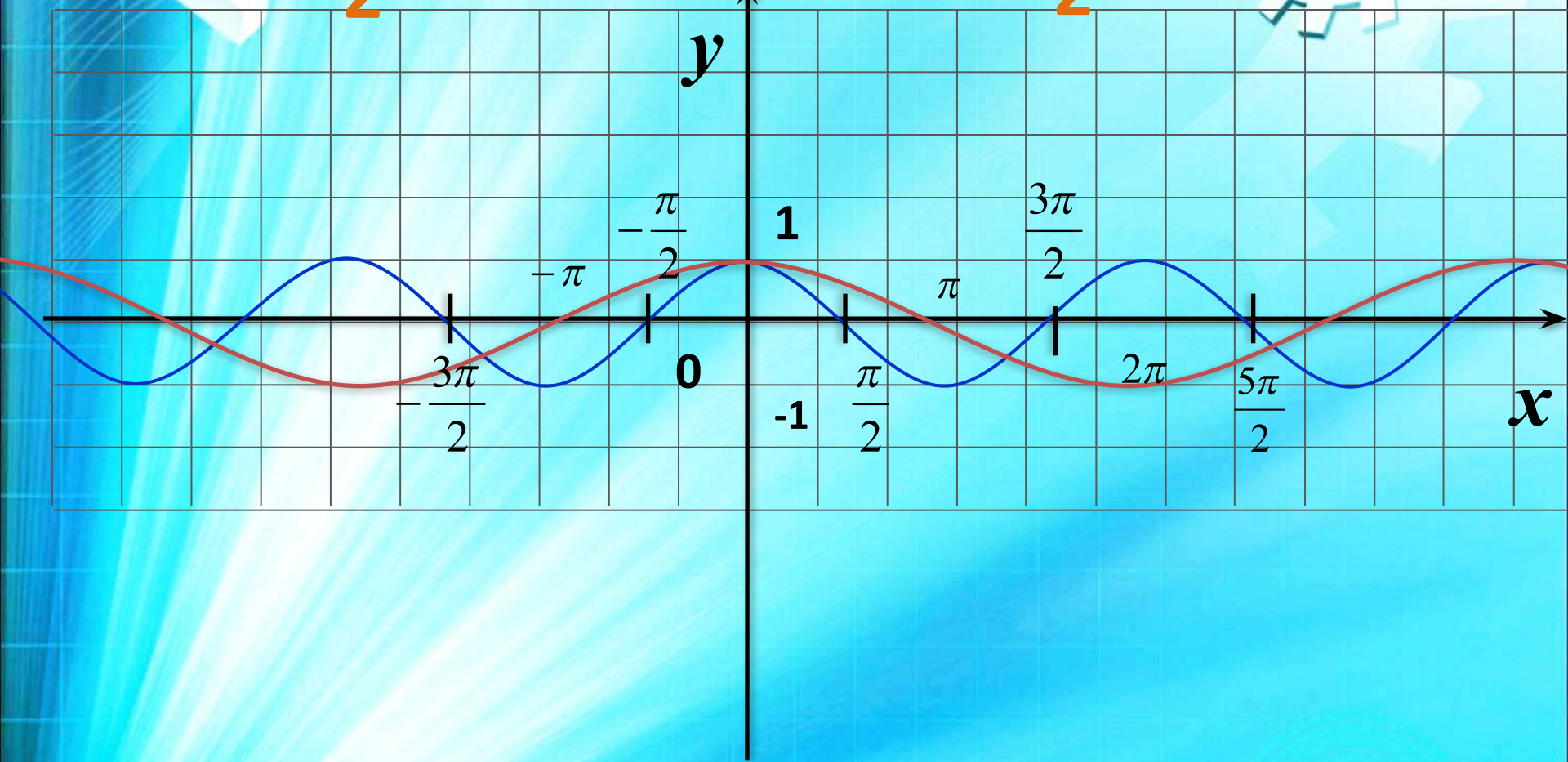


$$E=m \cdot c^2$$



$$y = \cos \frac{x}{2}$$

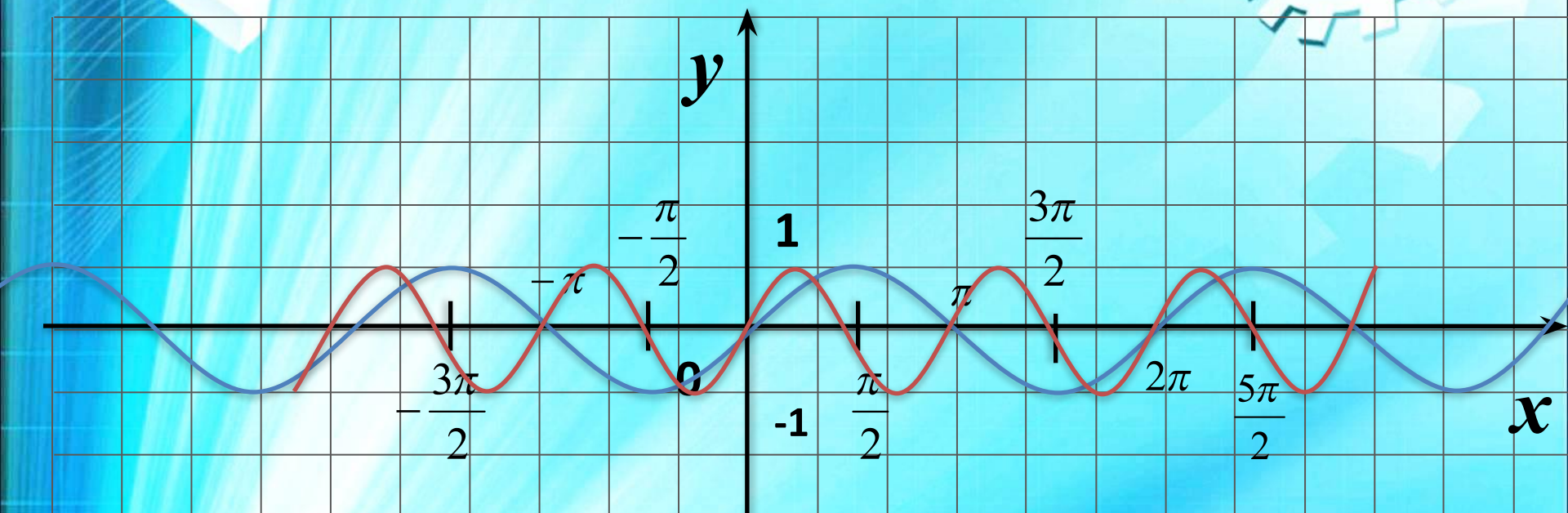
$$y = \cos \frac{x}{2}$$



$$E = m \cdot c^2$$

$$Y = \sin 2x$$

$$Y = \sin 2x$$

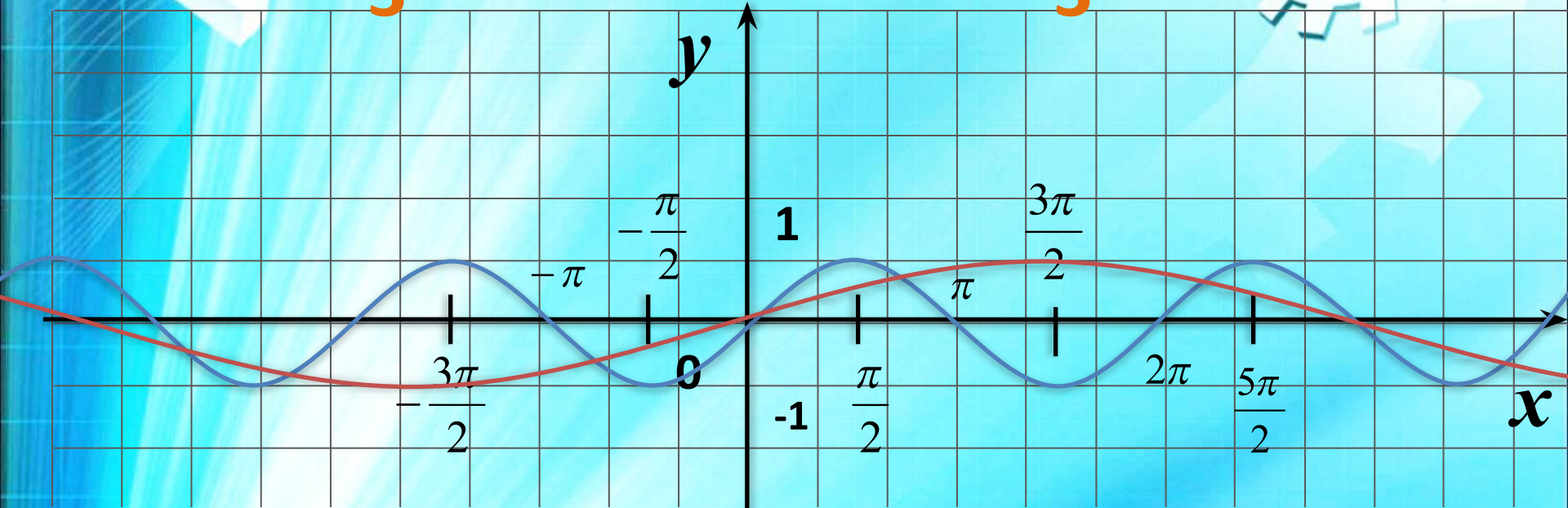


$$E = m \cdot c^2$$




$$y = \sin \frac{x}{3}$$

$$y = \sin \frac{x}{3}$$



$$E = m \cdot c^2$$

The background is a vibrant blue with a subtle grid pattern. In the top left, there are 3D rectangular blocks in white and purple. In the top right, a large, semi-transparent gear is visible. In the bottom left, a CD-ROM is shown. A bright light beam originates from the bottom left and spreads across the scene. In the bottom right, the equation  $E=mc^2$  is displayed in a glowing, semi-transparent font.

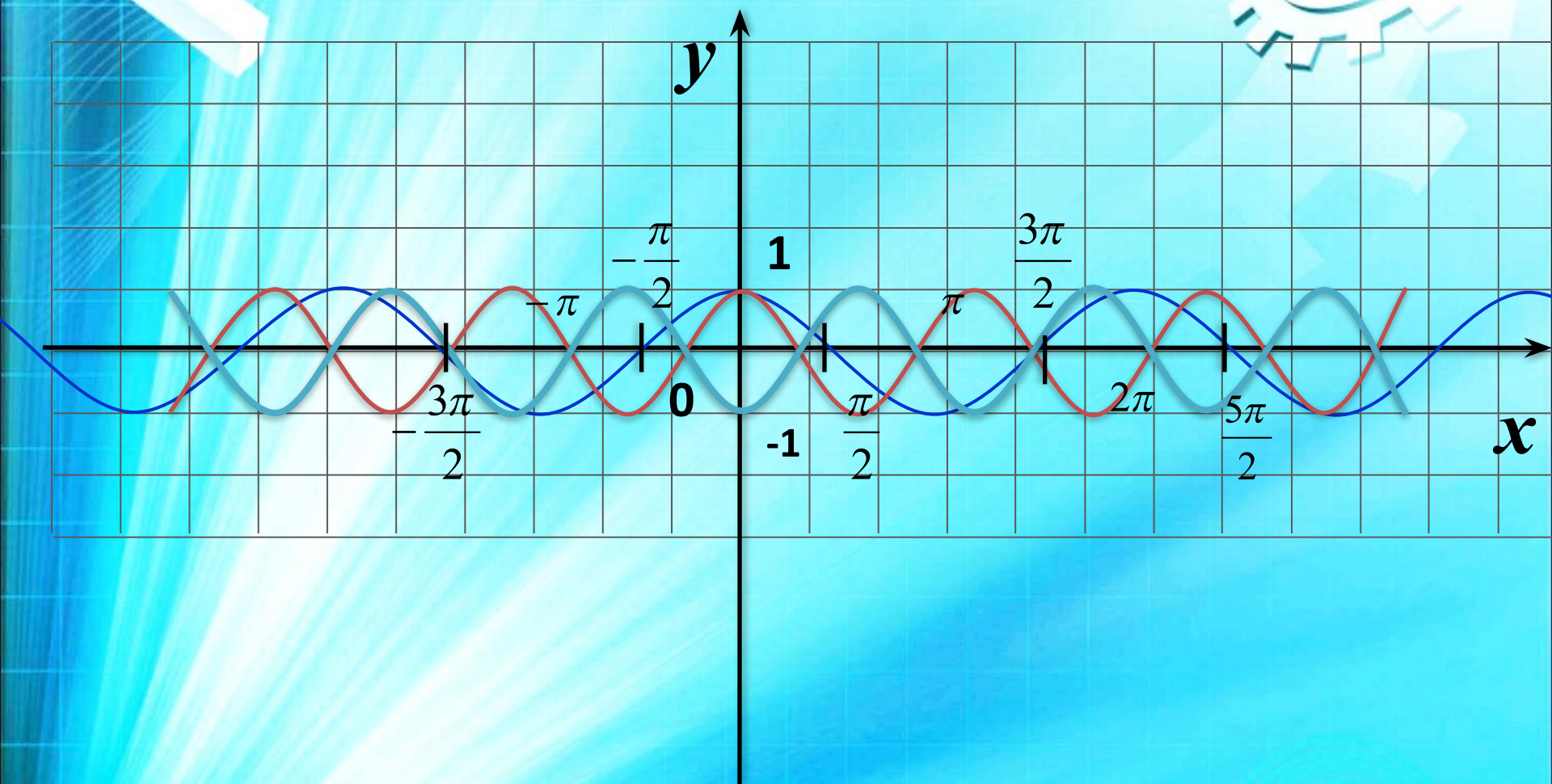
Построение  
графиков  
с помощью  
преобразований

$$E=mc^2$$



$$Y = -\cos 2x + 3$$

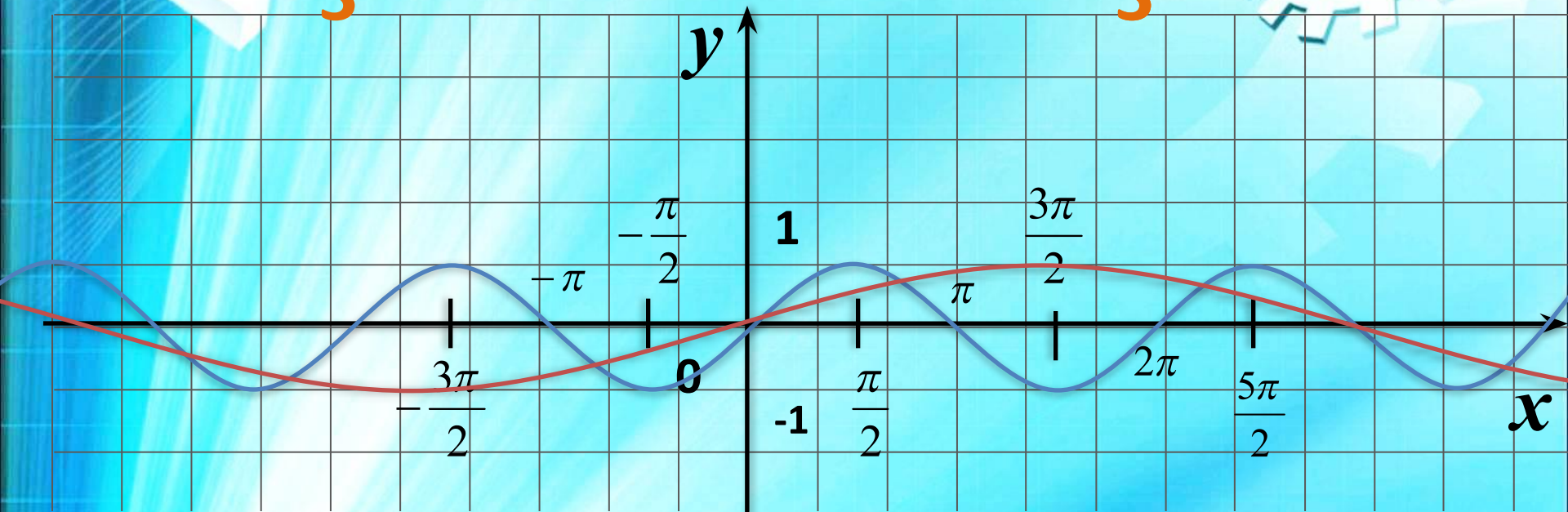
$$Y = \cos 2x + 3$$



$$E = m \cdot c^2$$

$$y = \sin \frac{x}{3} - 2$$

$$y = \sin \frac{x}{3} - 2$$



$$E = m \cdot c^2$$



Построить

самостоятельно:


$$y = 2\sin x - 1 \text{ вариант}$$

$$y = -\frac{1}{2}\cos x + 2$$

$$y = 3\sin\left(x - \frac{\pi}{3}\right)$$

$$y = -2\cos 2x$$

$$E = m \cdot c^2$$



**Желаем  
успеха  
в работе**

$$E=mc^2$$