

**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.

$$E=mc^2$$

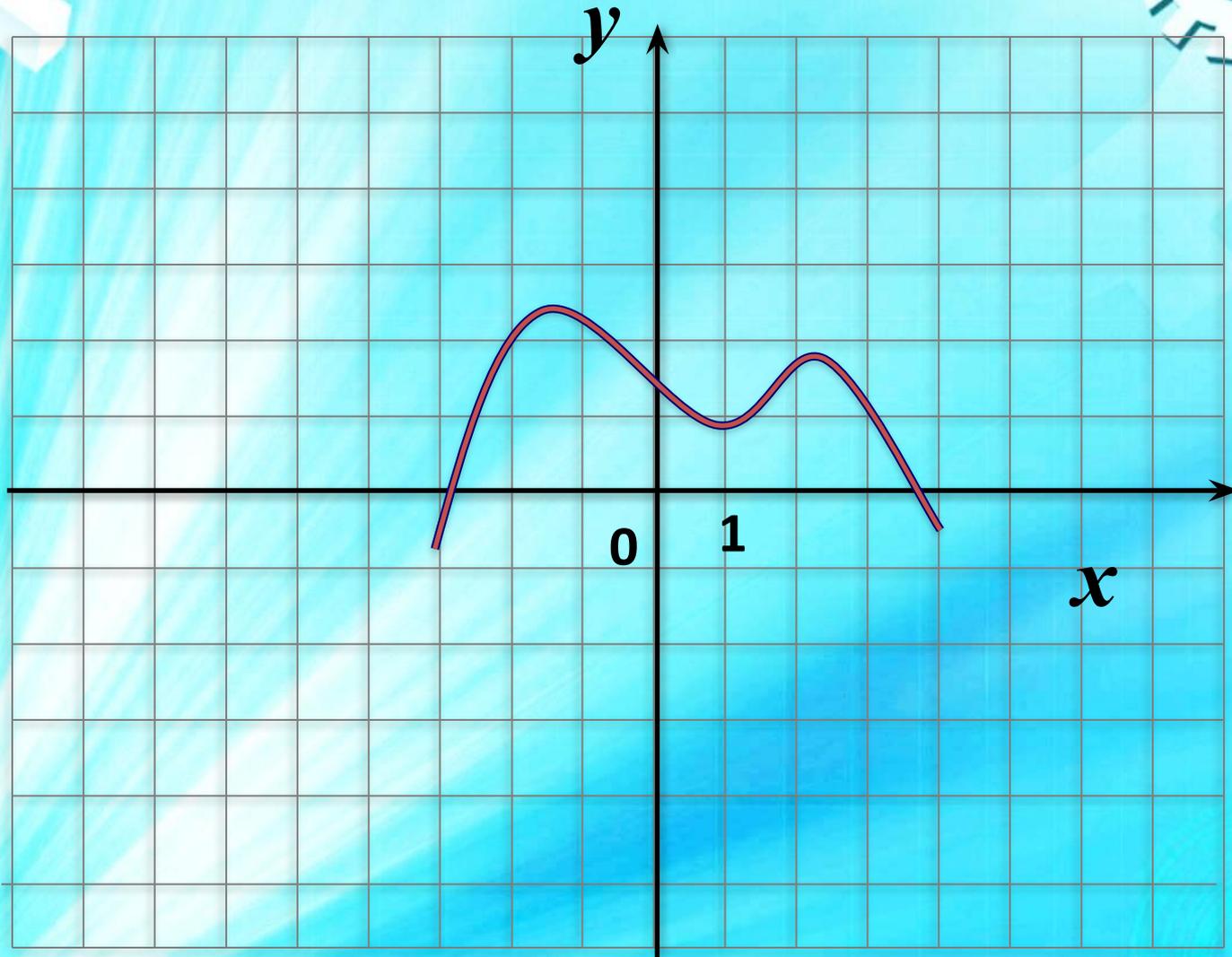


Построение
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$$Y=f(x)+a$$

$$E=mc^2$$

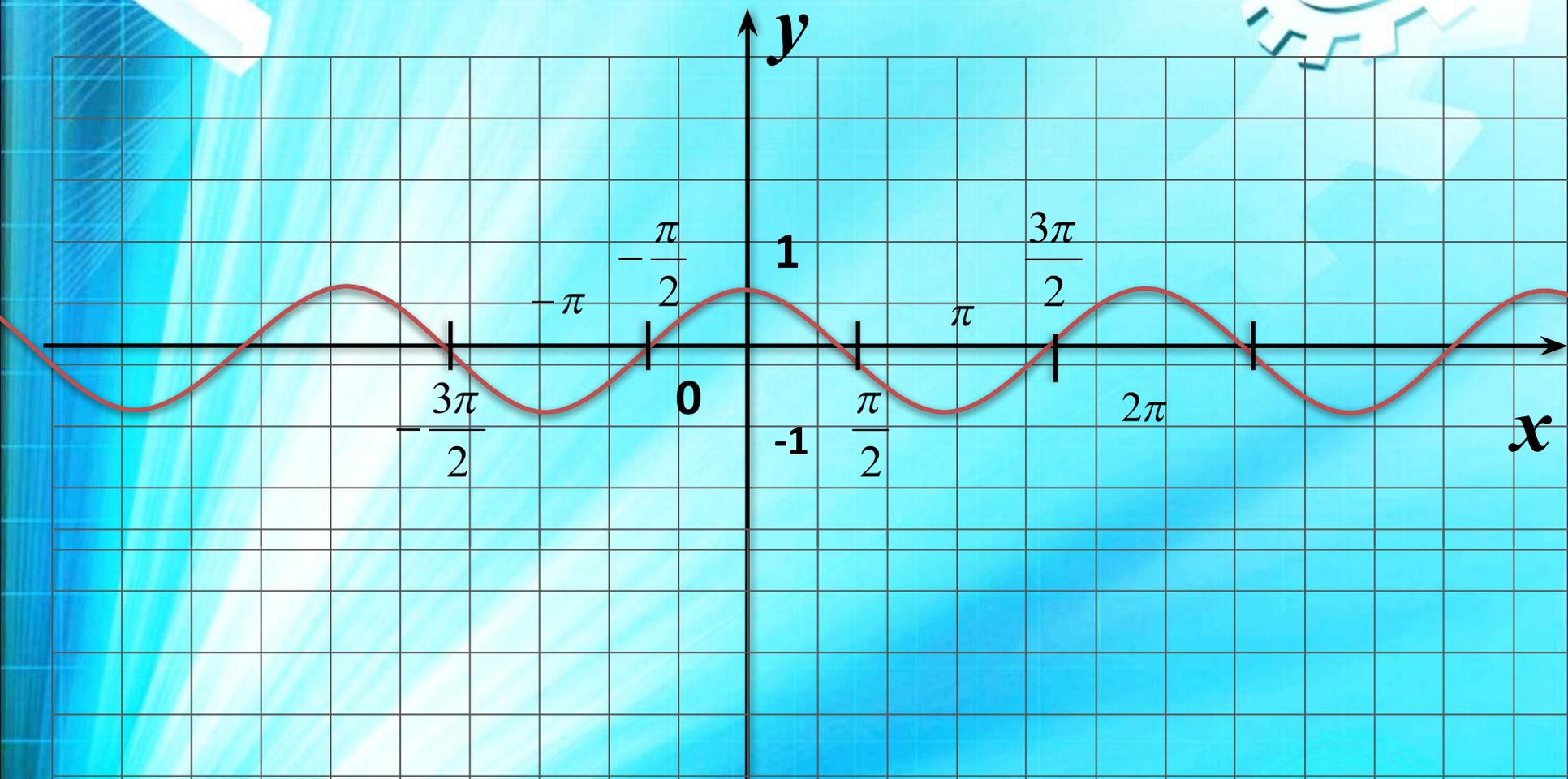
$$Y=f(x)+a$$



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

$$Y = \cos x - 3$$

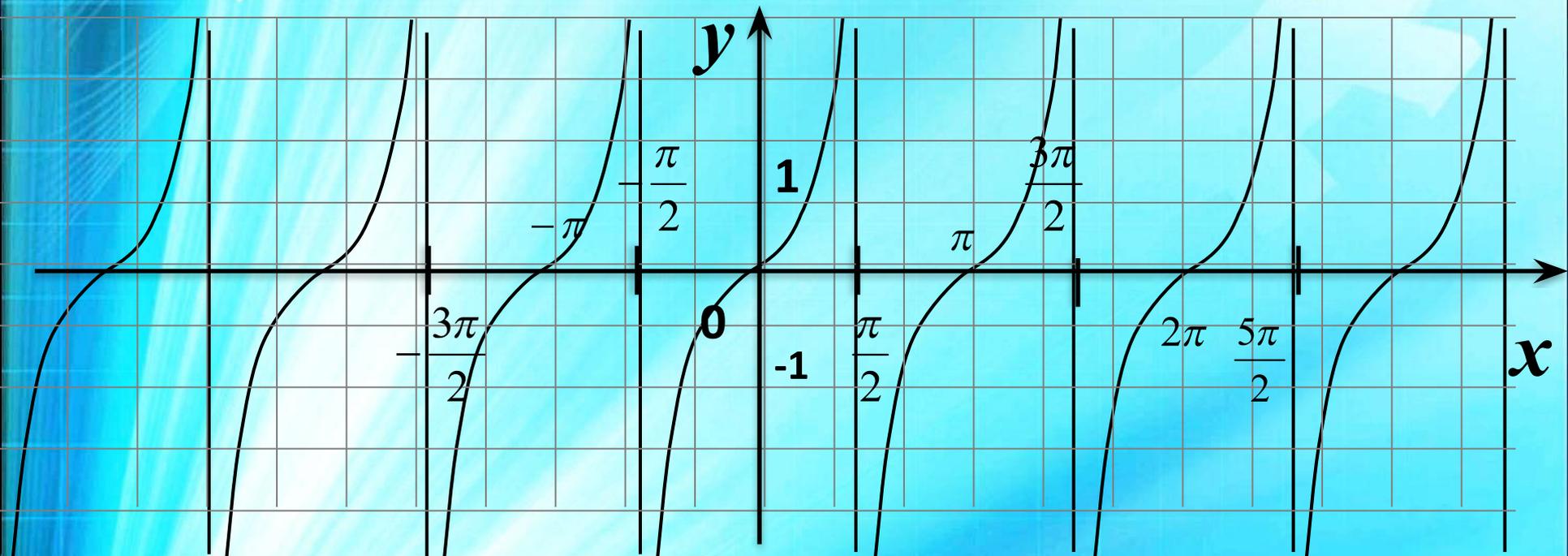
$$Y = \cos x - 3$$



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

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

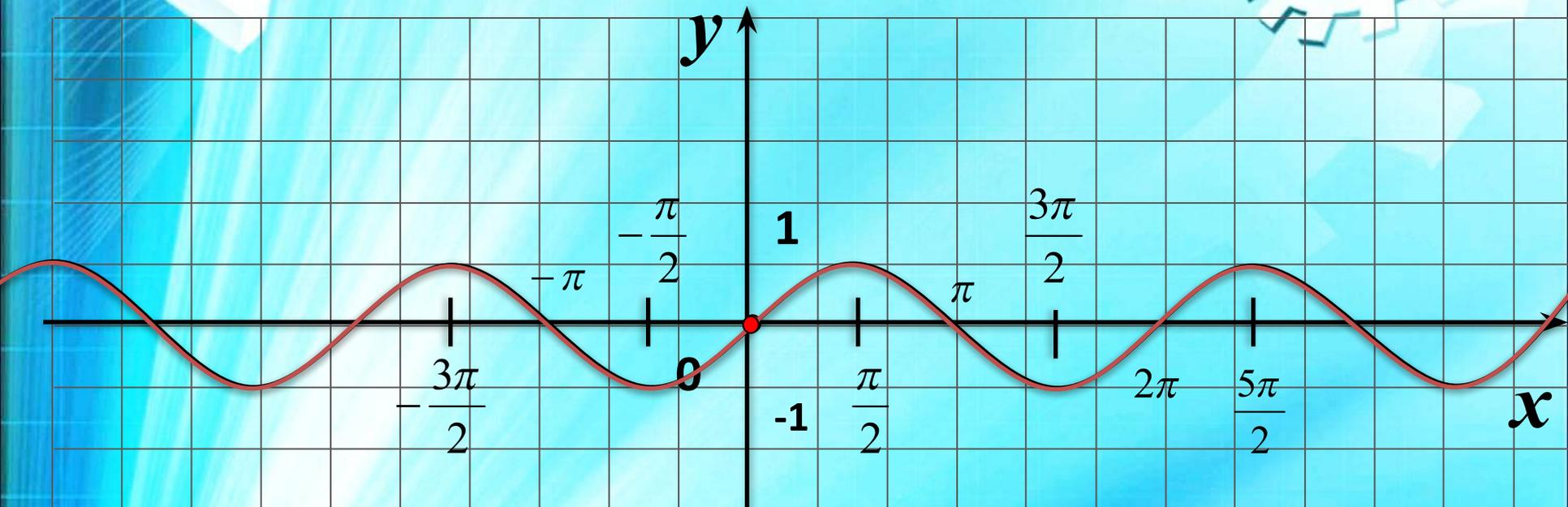
$$Y = \text{tg}x + 1$$



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

$$Y = \sin X - 2$$

$$Y = \sin X - 2$$



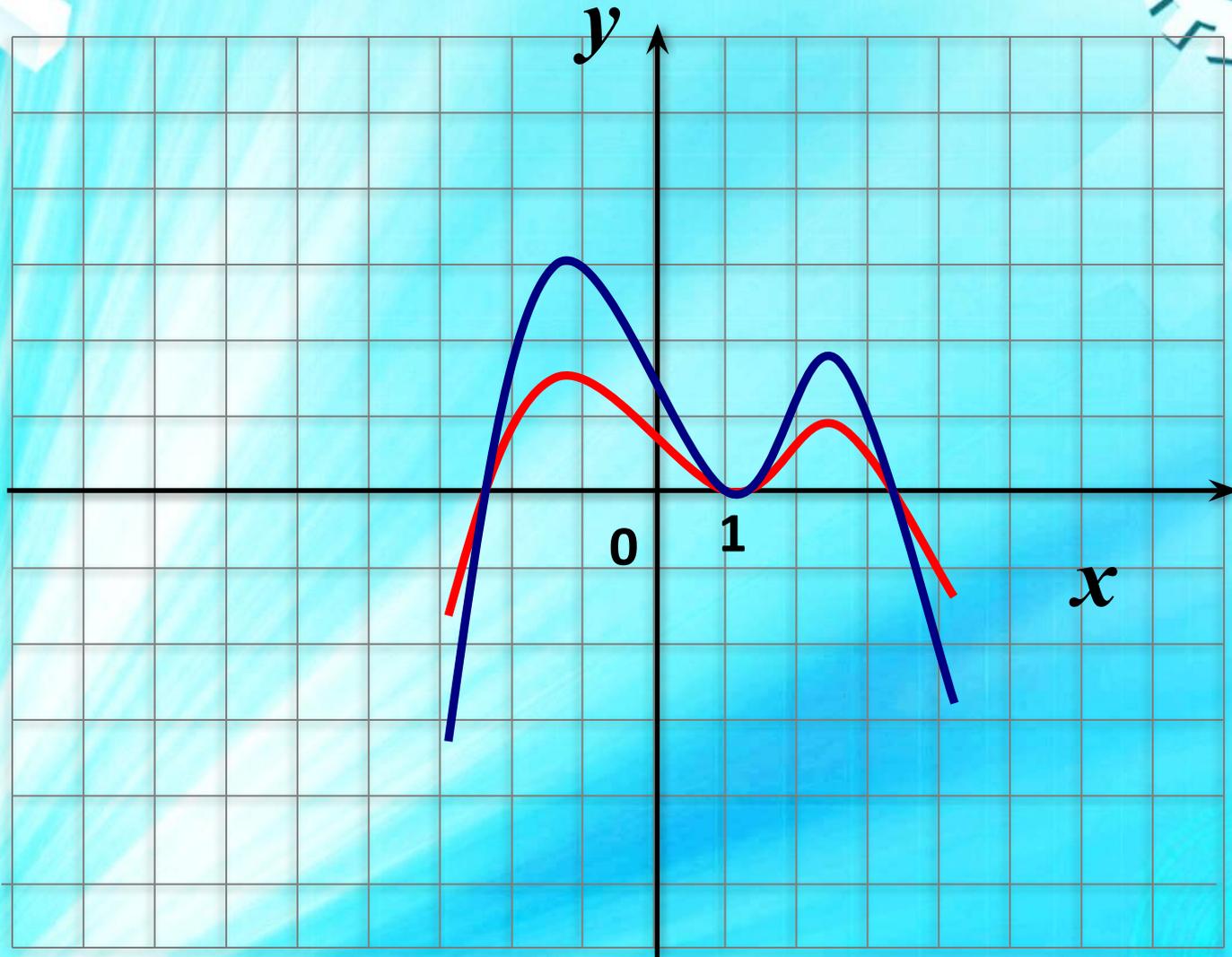
$$E = m \cdot c^2$$



Построение
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 $Y=kf(x)$

$$E=mc^2$$

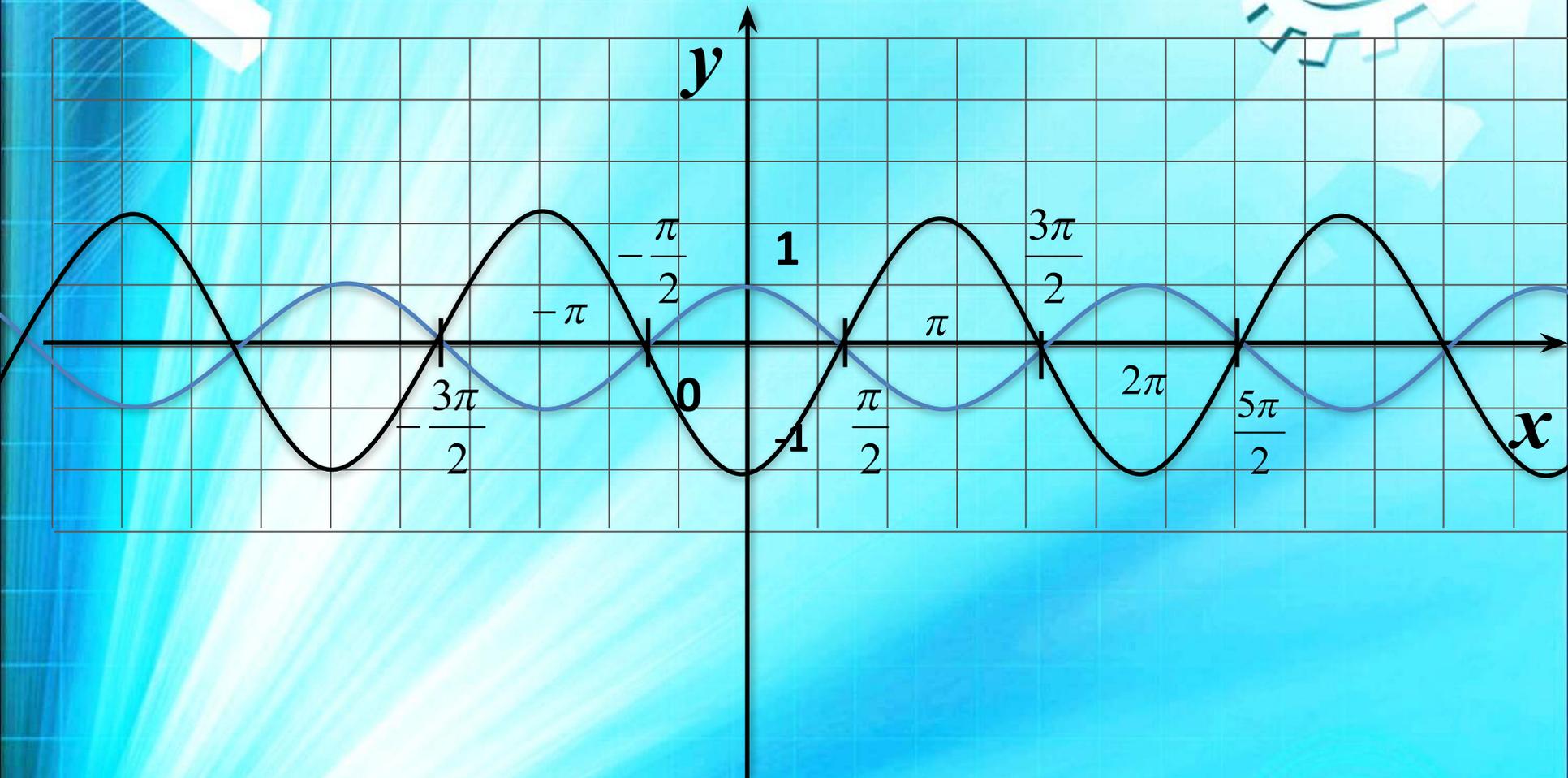
$$Y=f(g(x))$$



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

$$Y = -2 \cos x$$

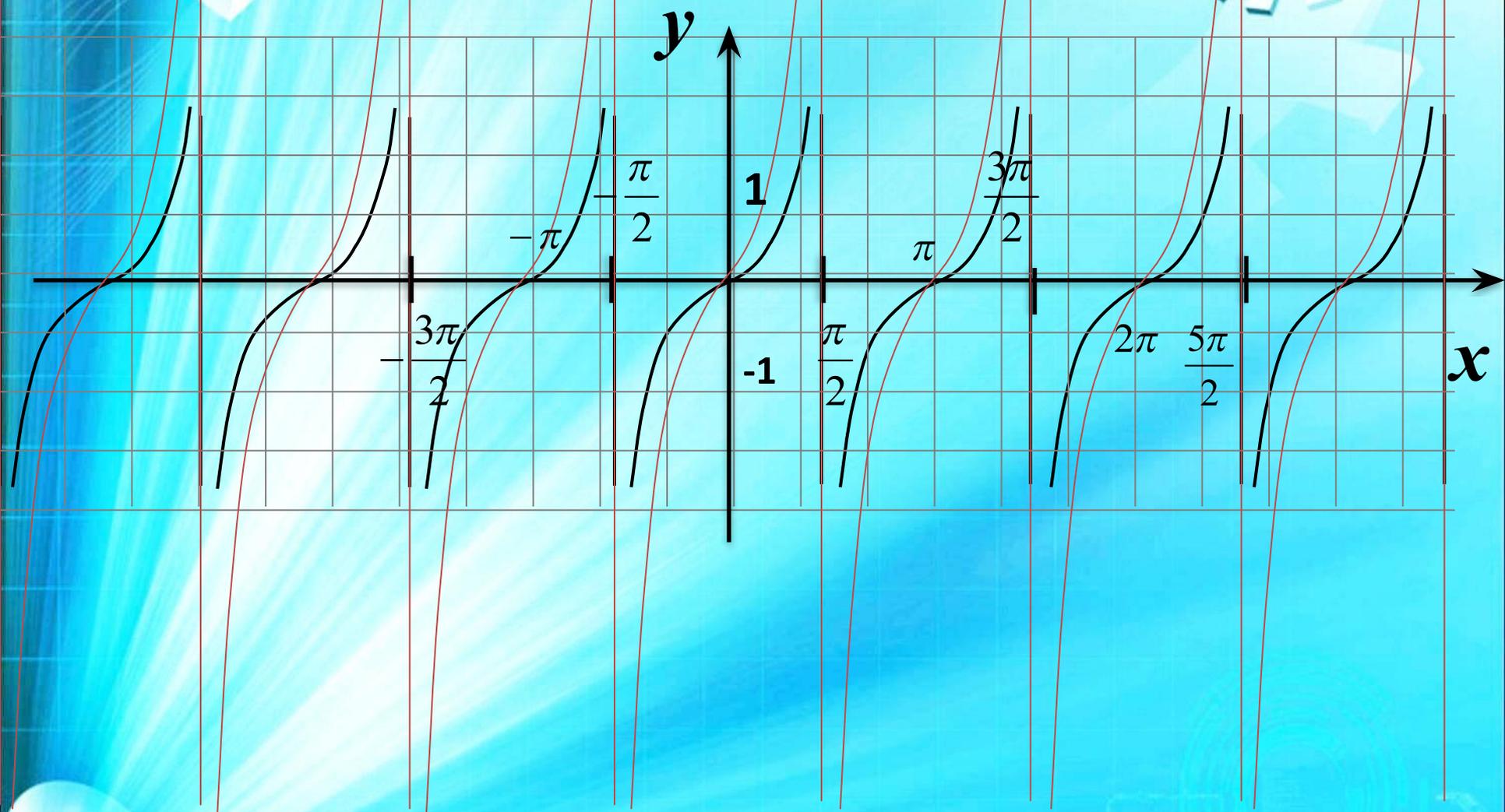
$$Y = \epsilon \sin x$$



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

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

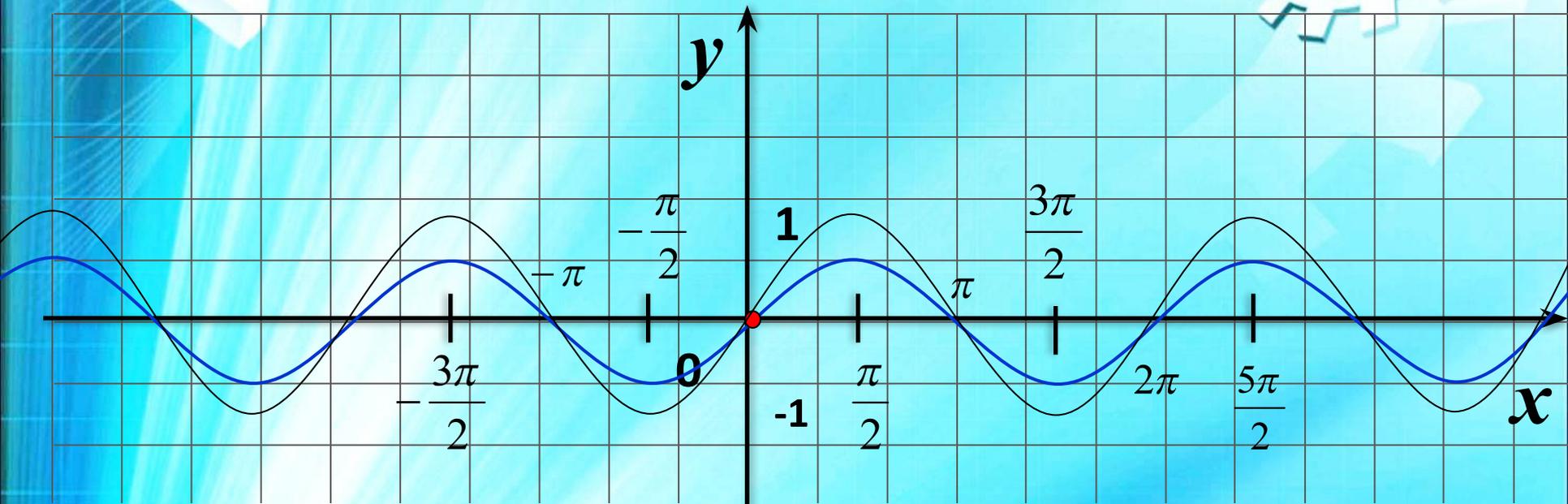
$$Y=3\text{tg}x$$



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

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

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



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

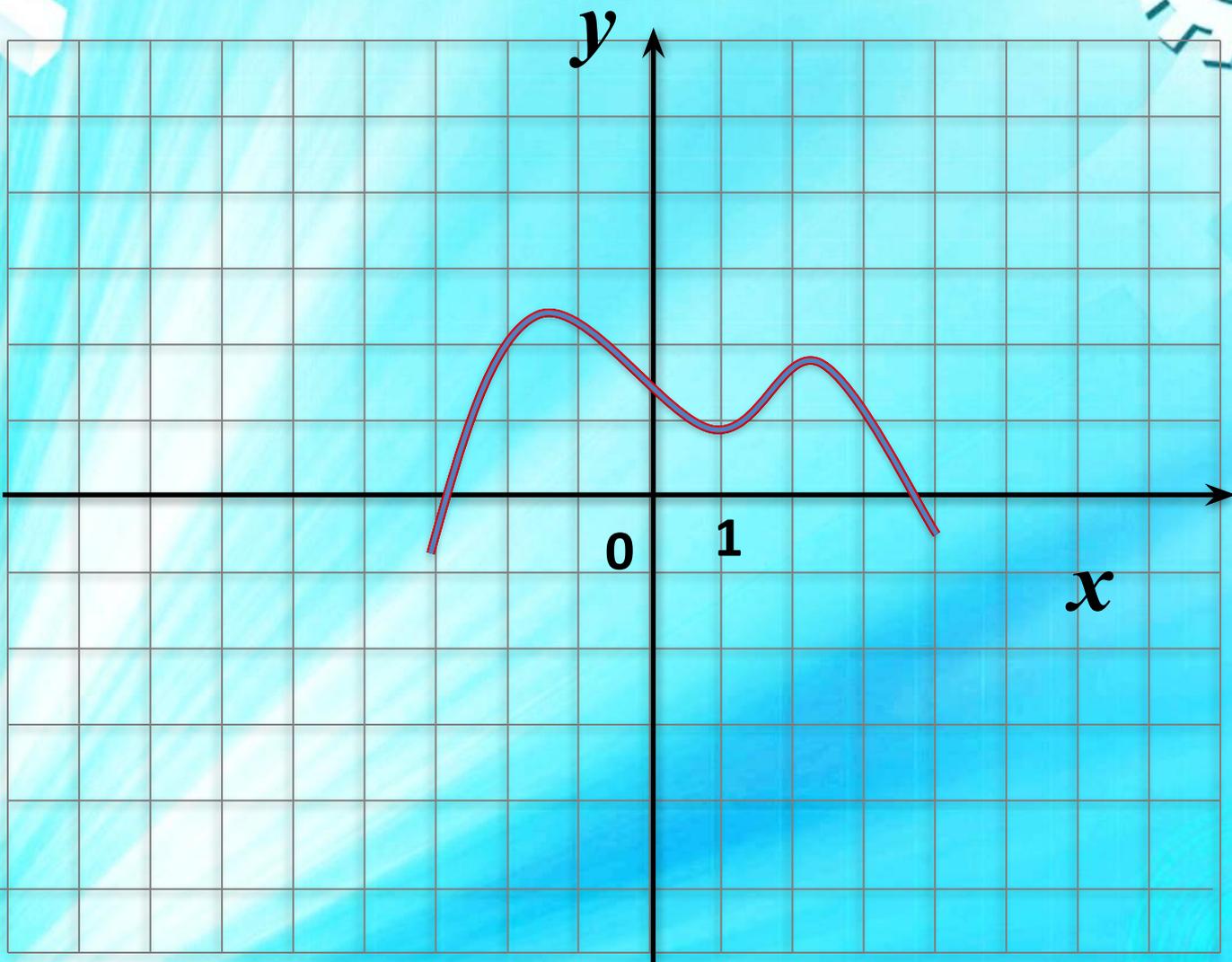
The background is a vibrant blue with a subtle grid pattern. In the top right corner, there is a large, semi-transparent gear. On the left side, a bright light beam emanates from a point, creating a fan of rays that spread across the frame. In the bottom right corner, the equation $E=mc^2$ is faintly visible.

Построение
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$$Y=f(x+b)$$

$$E=mc^2$$

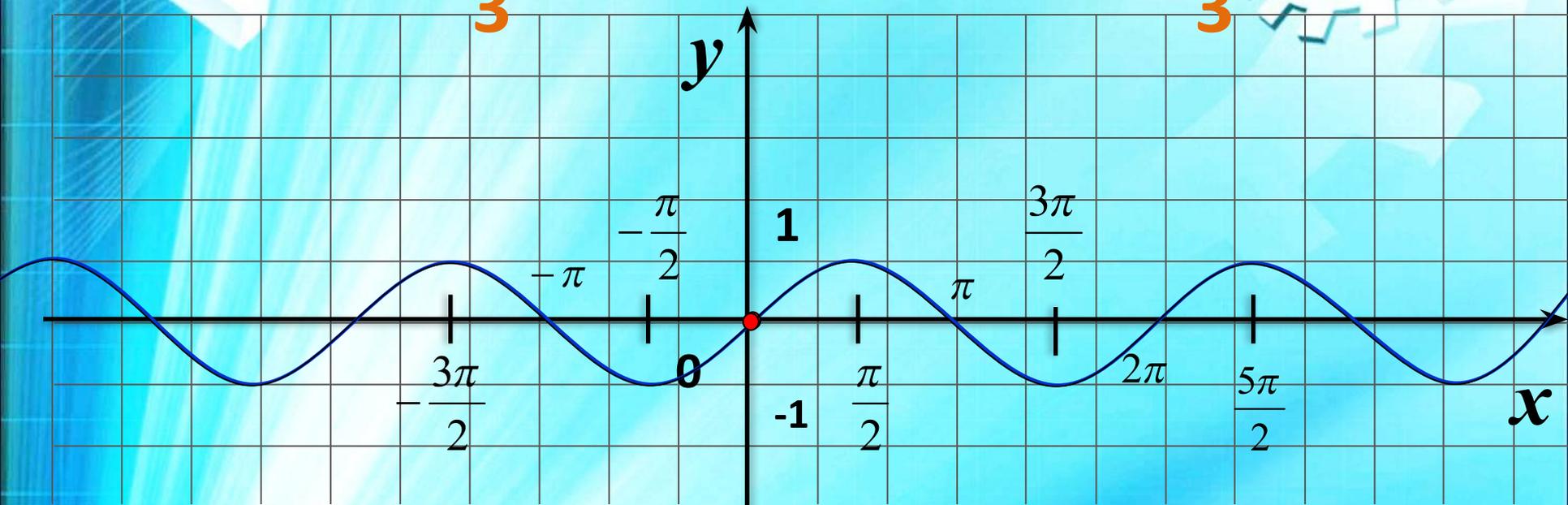
$$Y=f(x)+b$$



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

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

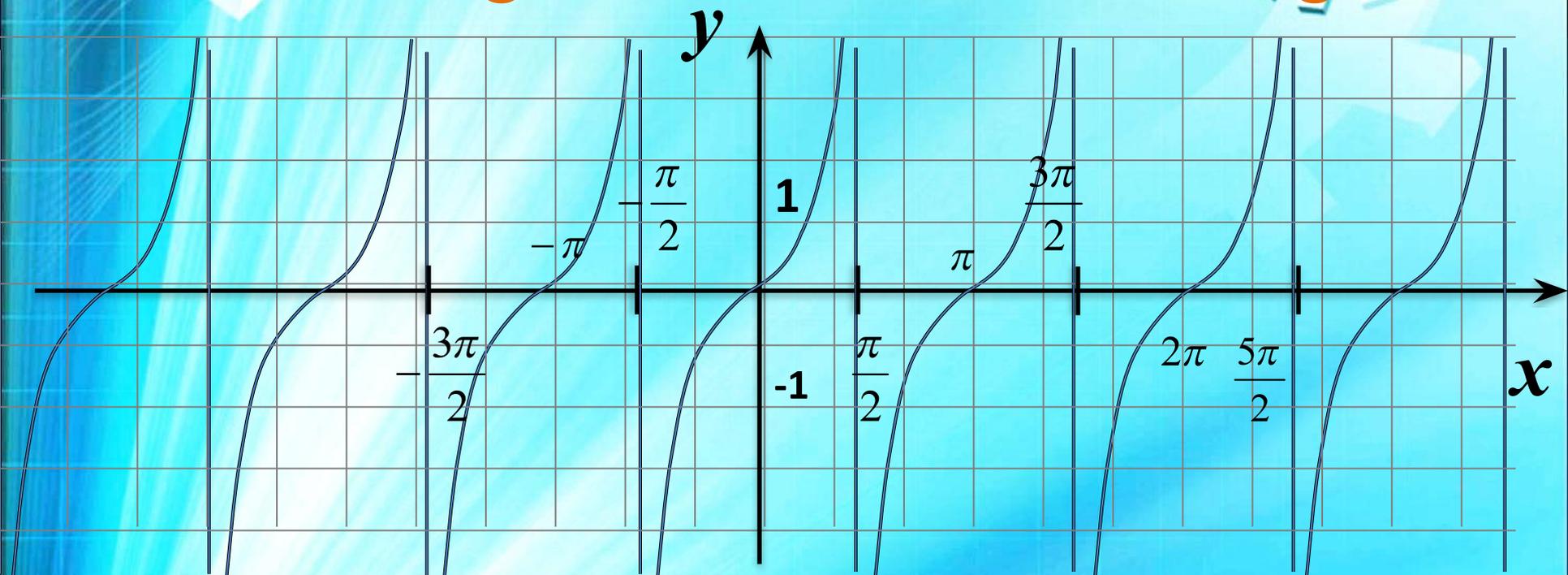
$$y = \sin\left(x + \frac{\pi}{3}\right)$$



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

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

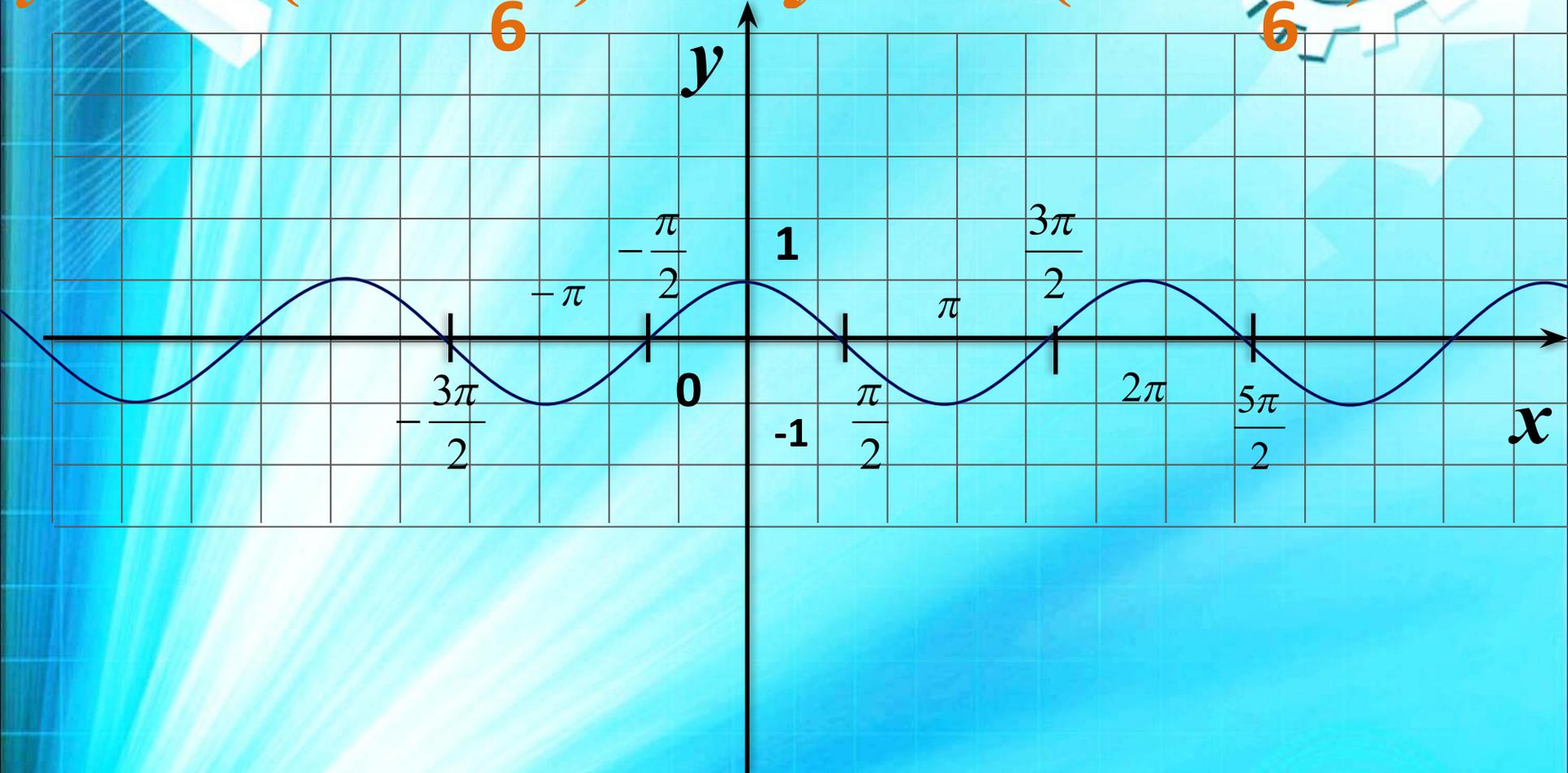
$$y = \operatorname{tg}\left(x - \frac{\pi}{3}\right)$$



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

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

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



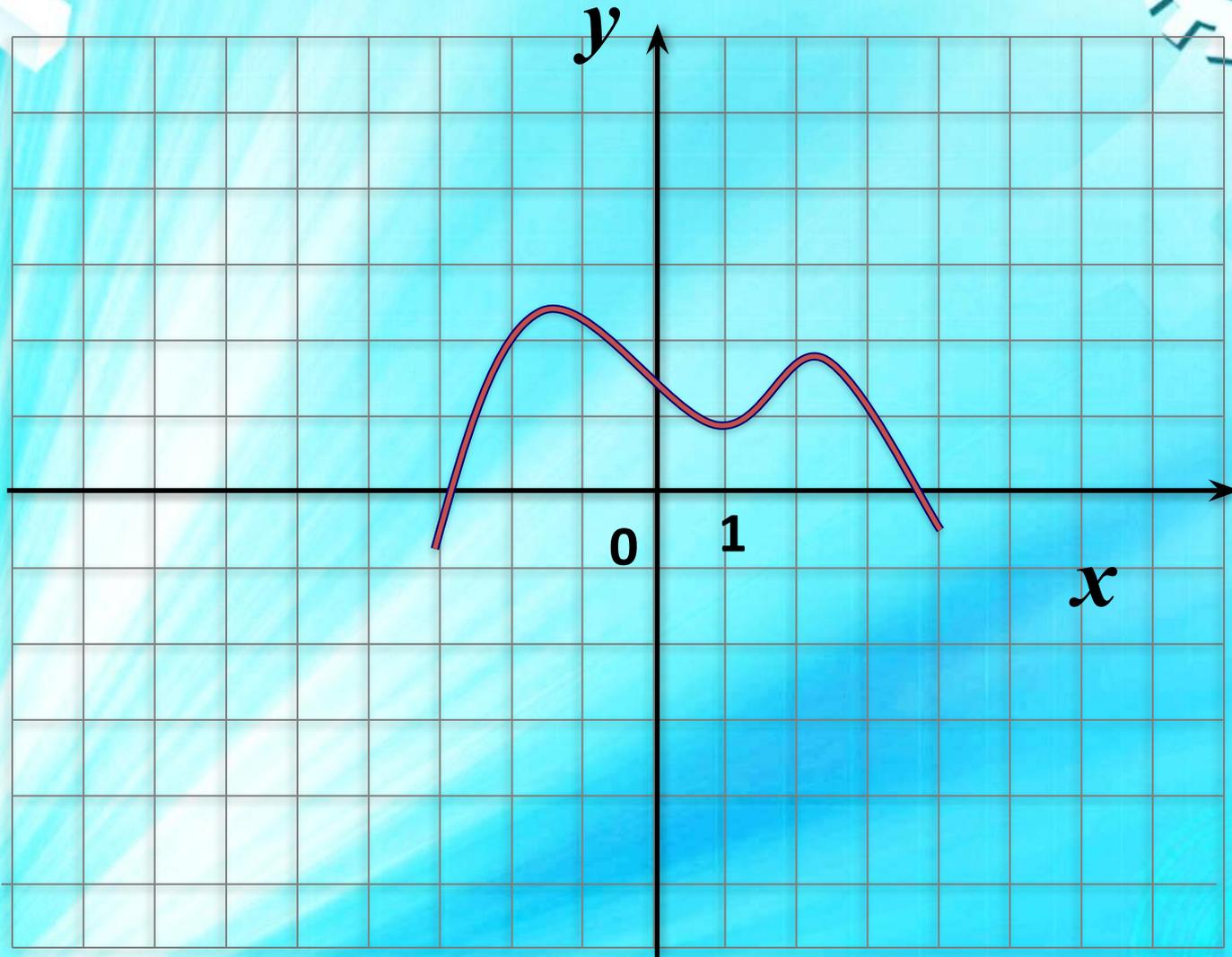
$$E = m \cdot c^2$$

The background is a vibrant blue with a subtle grid pattern. In the top right corner, there is a large, semi-transparent gear. On the left side, a bright light beam emanates from a point, creating a fan of rays that spread across the frame. In the bottom right corner, the equation $E=mc^2$ is visible in a semi-transparent font.

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 $Y=f(kx)$

$$E=mc^2$$

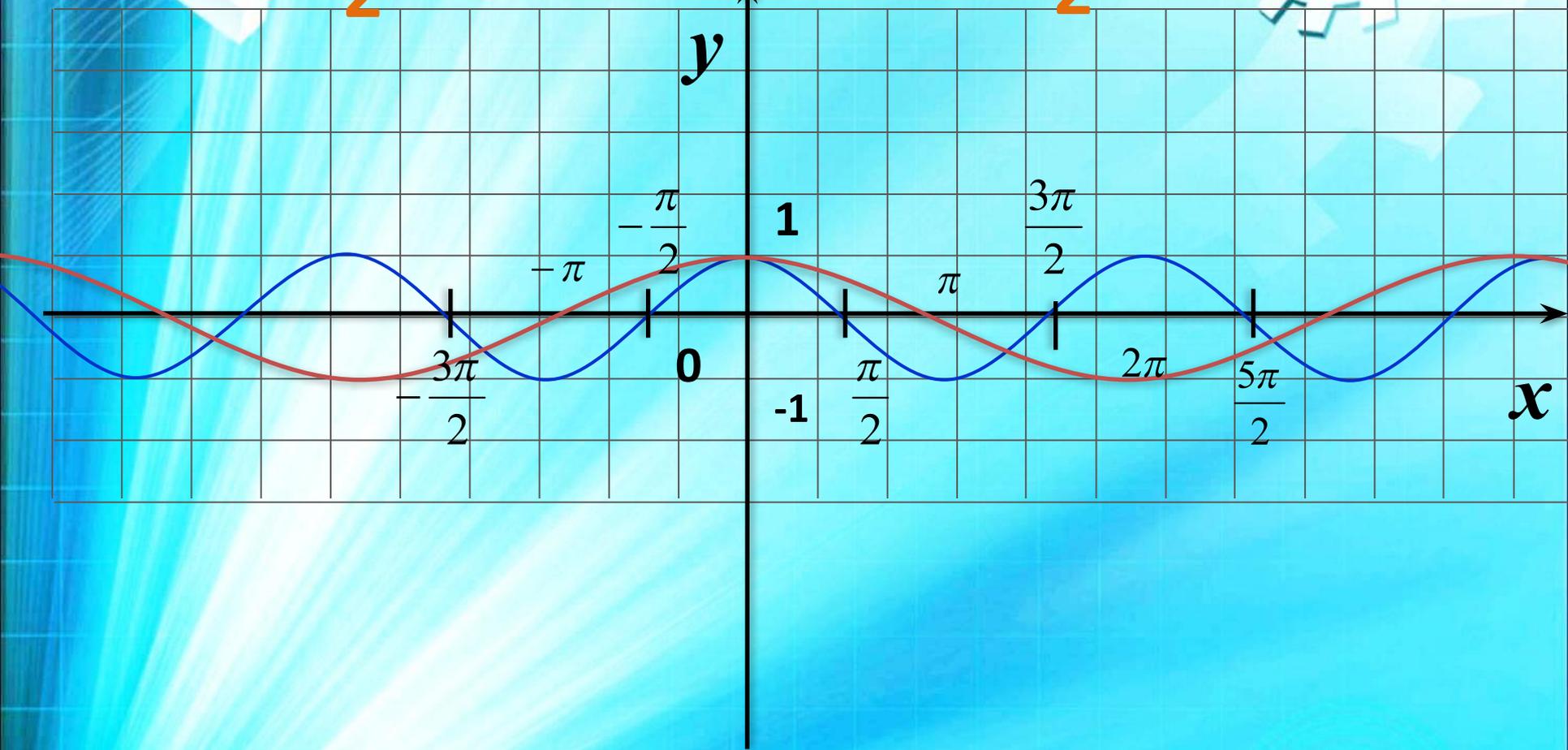
$$Y=f(kx)$$



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

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

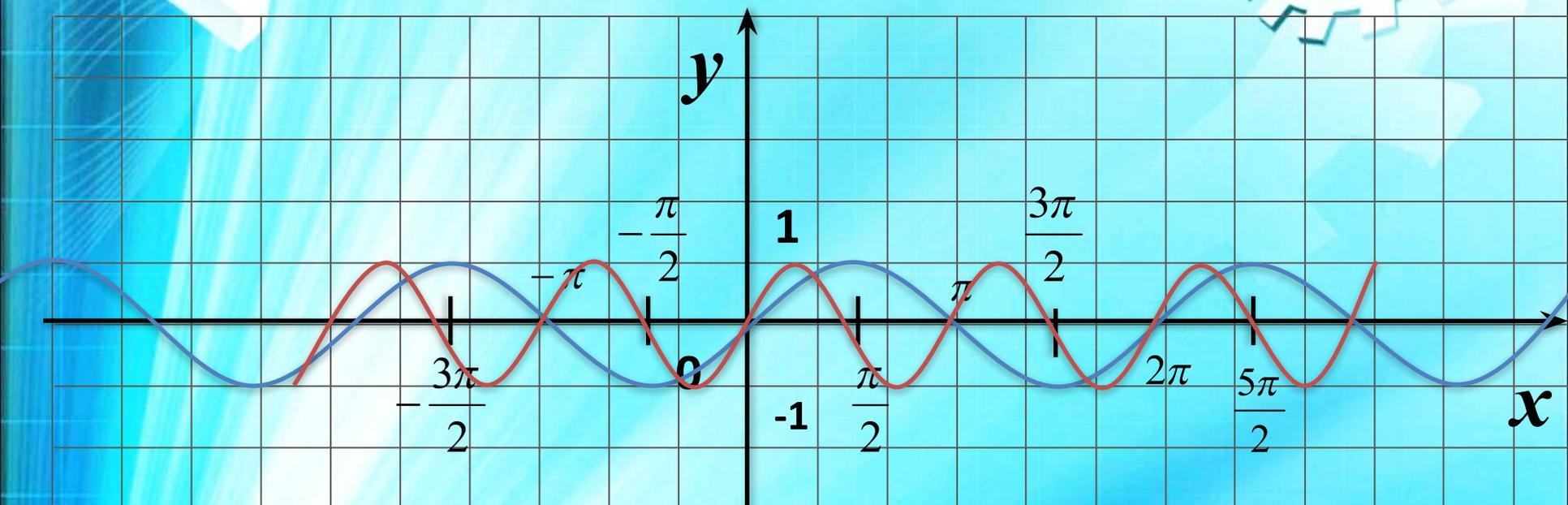
$$y = \cos \frac{x}{2}$$



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

$$Y = \sin 2x$$

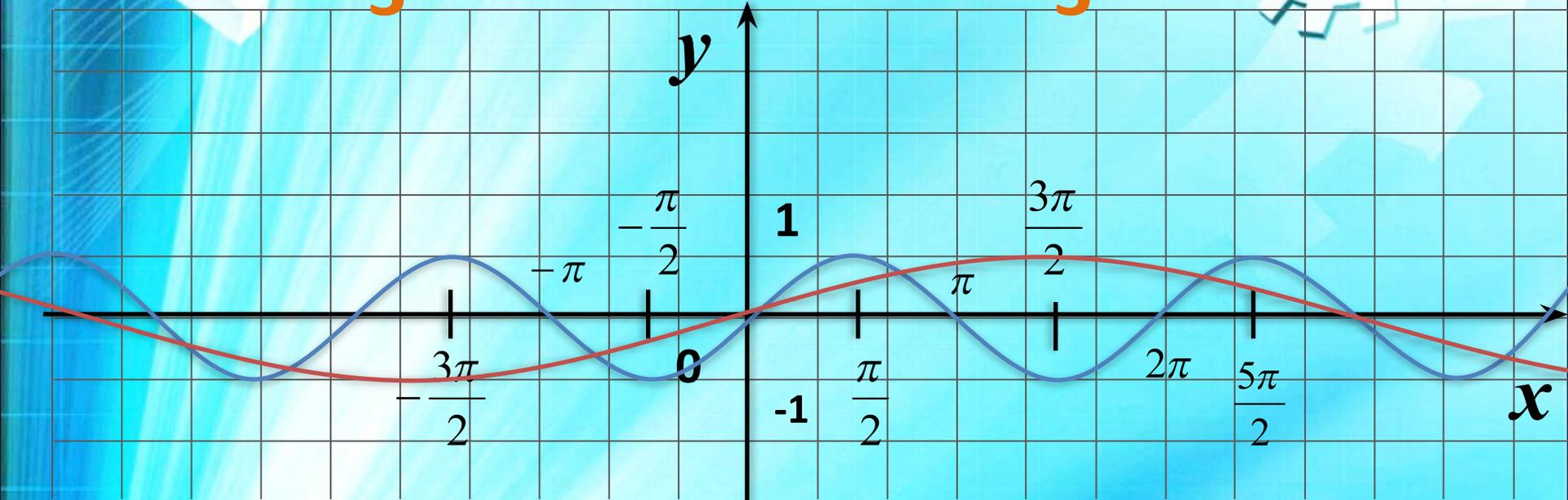
$$Y = \sin 2x$$



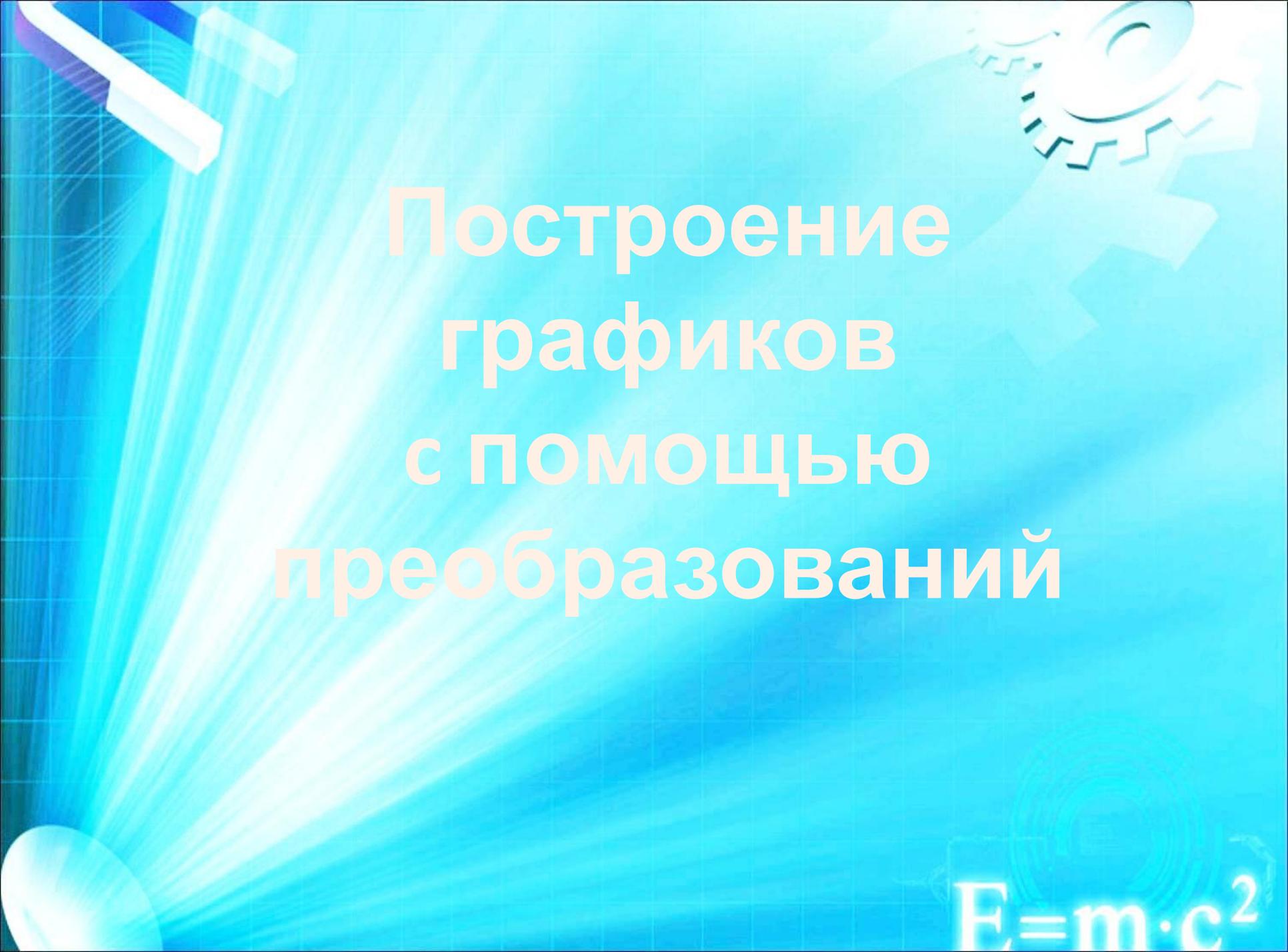
$$E = m \cdot c^2$$

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

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



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

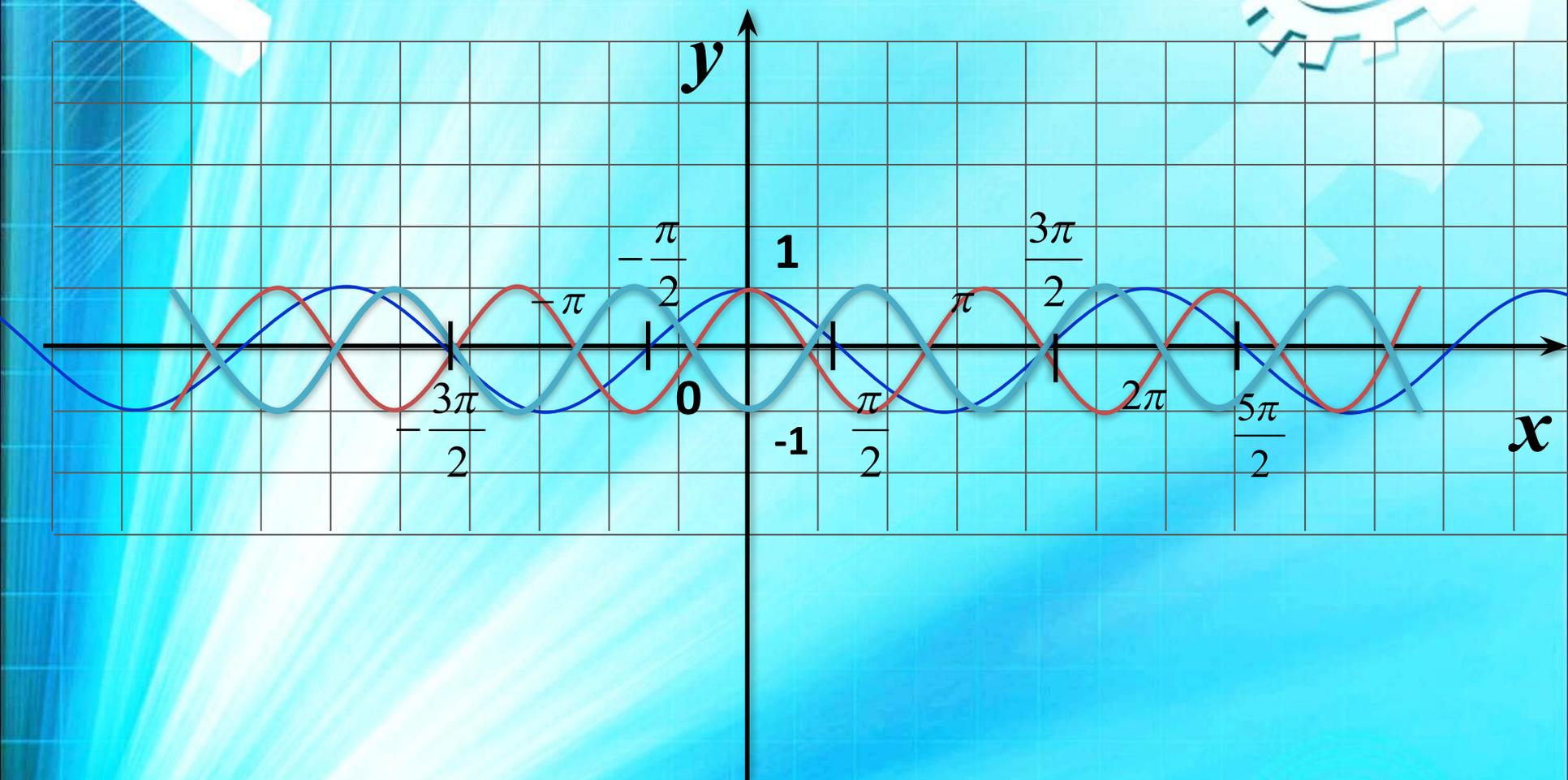


Построение
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$$E = m \cdot c^2$$

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

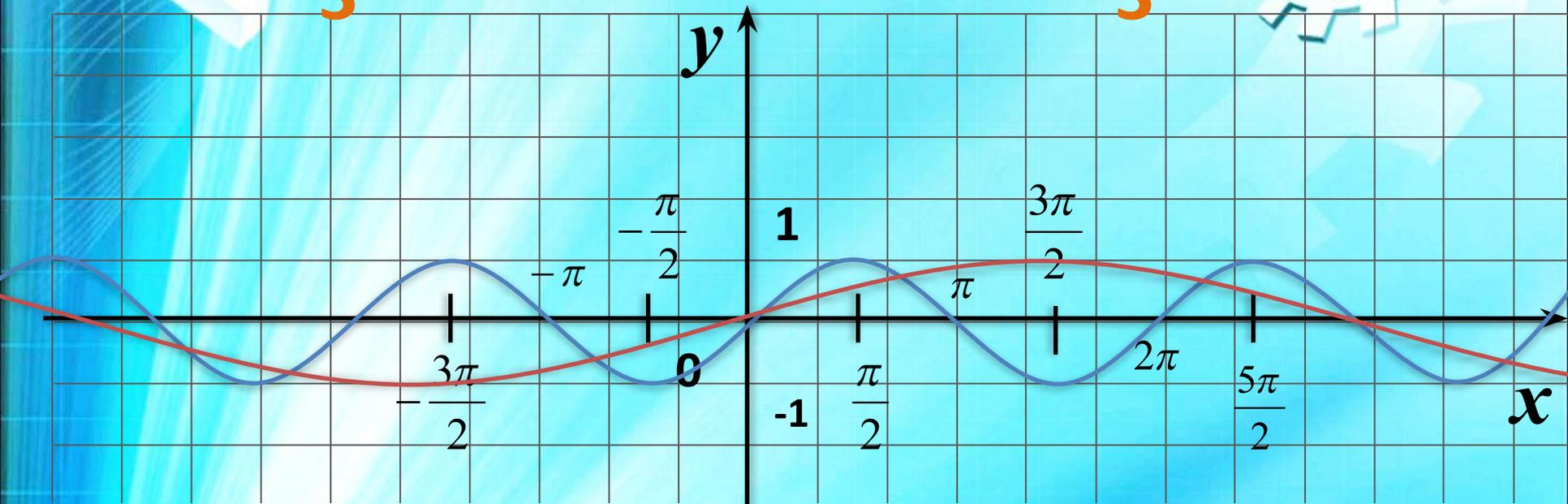
$$Y = \cos 2x + 3$$



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

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

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



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

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**

$$E=mc^2$$