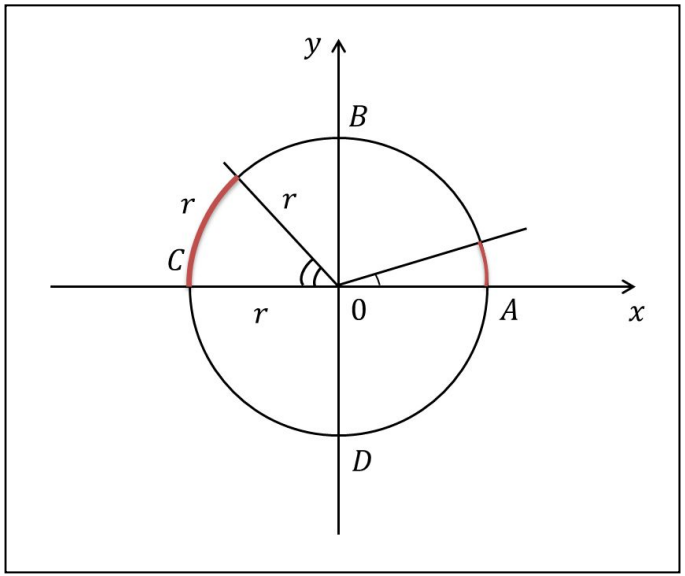


Тригонометрические функции углового аргумента

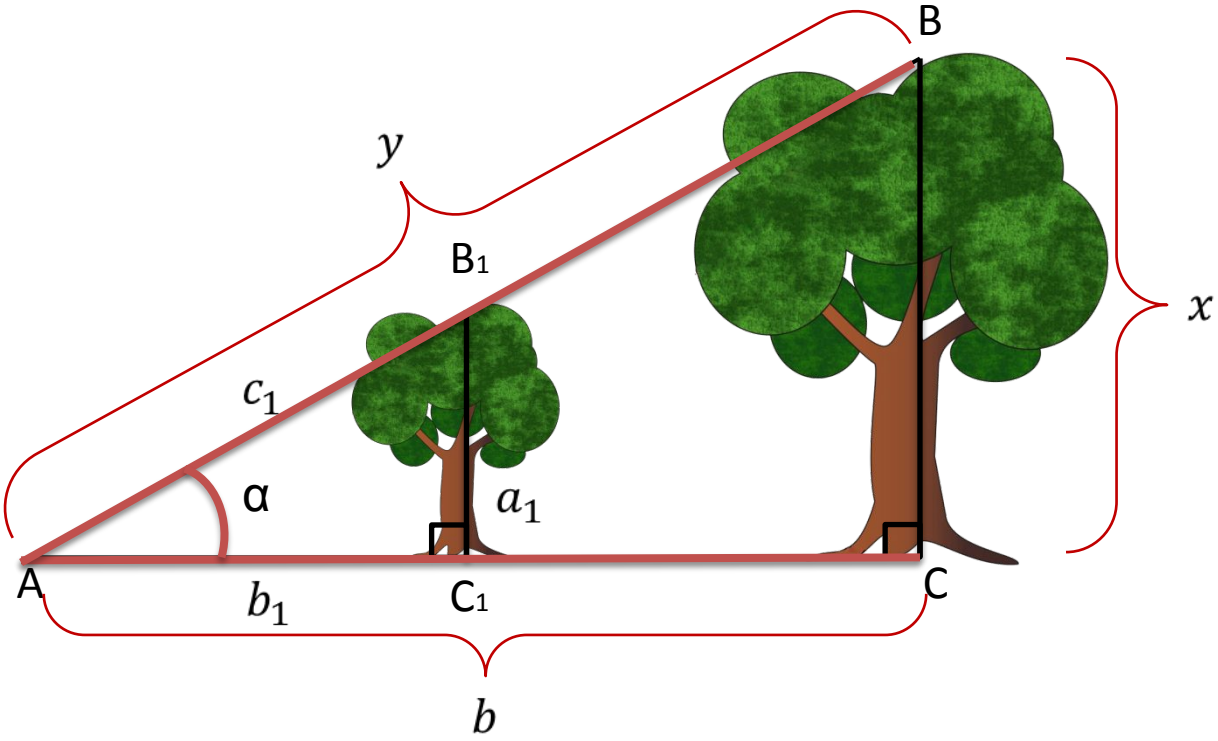
Тригонометрические функции числового аргумента

$y = sin\, t$

$y = cos\, t$

$y = tg\, t$

$y = ctg\, t$



$\triangle ABC \sim \triangle AB_1C_1$

$$\frac{x}{a_1} = \frac{b}{b_1}$$

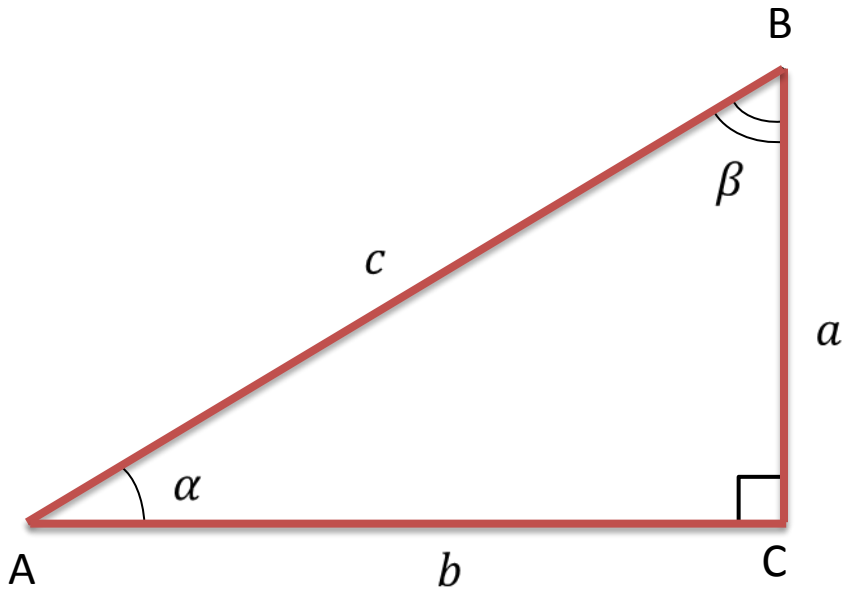
$$x = b \cdot \frac{a_1}{b_1}$$

$$\frac{a_1}{b_1} = tg\,\alpha \quad x = b \cdot tg\,\alpha$$

$$\frac{y}{c_1} = \frac{b}{b_1}$$

$$y = b \cdot \frac{c_1}{b_1} = \frac{b}{\frac{b_1}{c_1}}$$

$$\frac{b_1}{c_1} = cos\,\alpha \quad y = \frac{b}{cos\alpha}$$



$$\sin\alpha = \frac{a}{c} \qquad \sin\beta = \frac{b}{c}$$

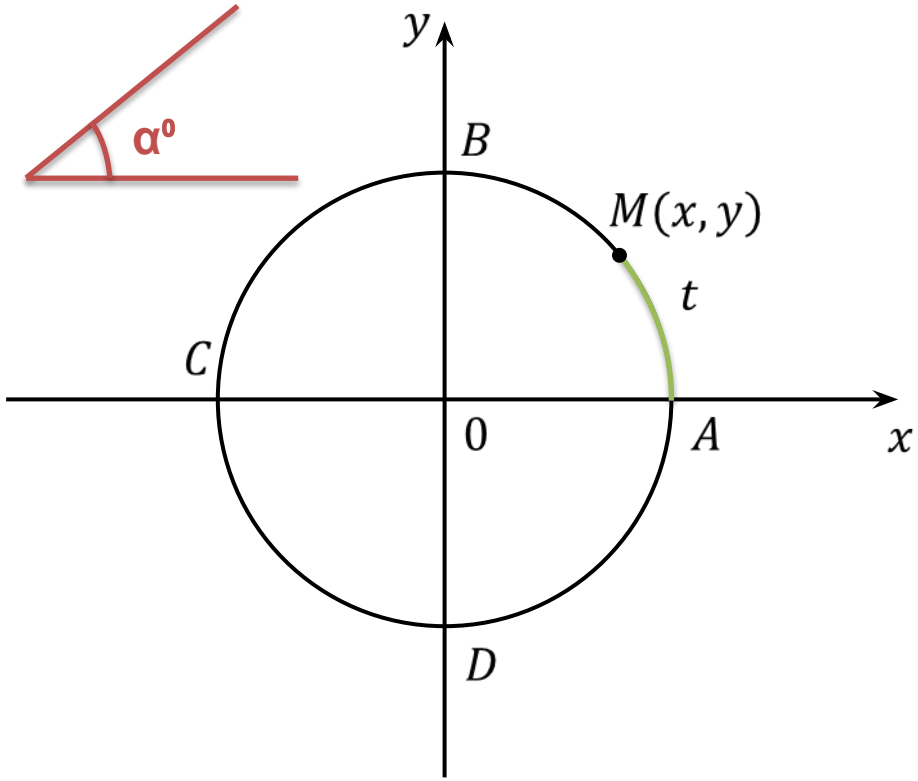
$$\cos\alpha = \frac{b}{c} \qquad \cos\beta = \frac{a}{c}$$

$$tg\,\alpha = \frac{a}{b} \qquad tg\,\beta = \frac{b}{a}$$

$$ctg\,\alpha = \frac{b}{a} \qquad ctg\,\beta = \frac{a}{b}$$

$$a = c \cdot \sin\alpha = c \cdot \cos\beta$$

$$a = b \cdot tg\,\alpha = b \cdot ctg\,\beta$$



$$x = \cos\alpha^\circ \qquad y = \sin\alpha^\circ$$

$$\frac{\alpha^\circ}{360^\circ} = \frac{t}{2\pi}$$

$$t = \frac{2\pi\alpha^\circ}{360^\circ} = \frac{\pi\alpha^\circ}{180^\circ}$$

$$\sin\alpha^\circ = \sin t = \sin\frac{\pi\alpha^\circ}{180^\circ}$$

$$\cos\alpha^\circ = \cos t = \cos\frac{\pi\alpha^\circ}{180^\circ}$$

Пример:

$$t = \frac{\pi\alpha^\circ}{180^\circ}$$

Найти а) $sin\,30^\circ$, б) $cos\,60^\circ$.

Решение:

градусная мера угла

радианная мера угла

а) $sin\,30^\circ = sin\frac{\pi\cdot 30^\circ}{180^\circ} = sin\frac{\pi}{6} = \frac{1}{2}$

б) $cos\,60^\circ = cos\frac{\pi\cdot 60^\circ}{180^\circ} = cos\frac{\pi}{3} = \frac{1}{2}$

$$\alpha^\circ = \frac{\pi\alpha^\circ}{180^\circ} \text{ рад}$$

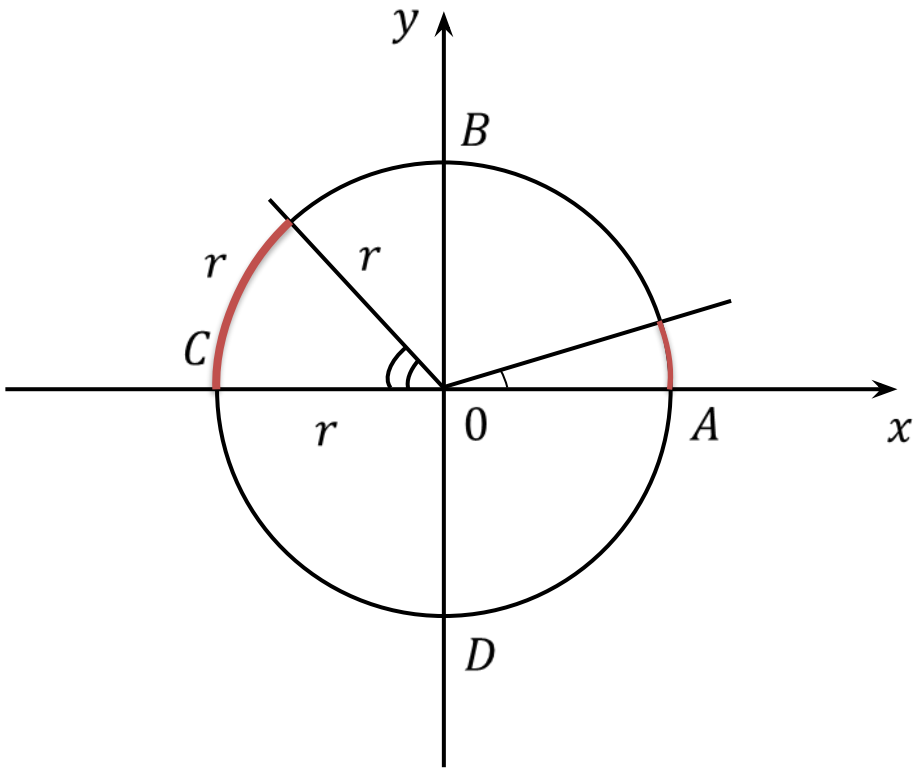
$$1^\circ = \frac{\pi}{180^\circ} \text{ рад}$$

$$1 \text{ рад} = \frac{180^\circ}{\pi}$$

$$65^\circ = \frac{\pi \cdot 65^\circ}{180^\circ} = \frac{13\pi}{36} \text{ рад}$$

$$\frac{4\pi}{3} = \frac{4\pi}{3} \cdot \frac{180^\circ}{\pi} = 4 \cdot 60^\circ = 240^\circ$$

$$sin\, 45^\circ = sin \frac{\pi \cdot 45^\circ}{180^\circ} = sin \frac{\pi}{4} = \frac{\sqrt{2}}{2}$$

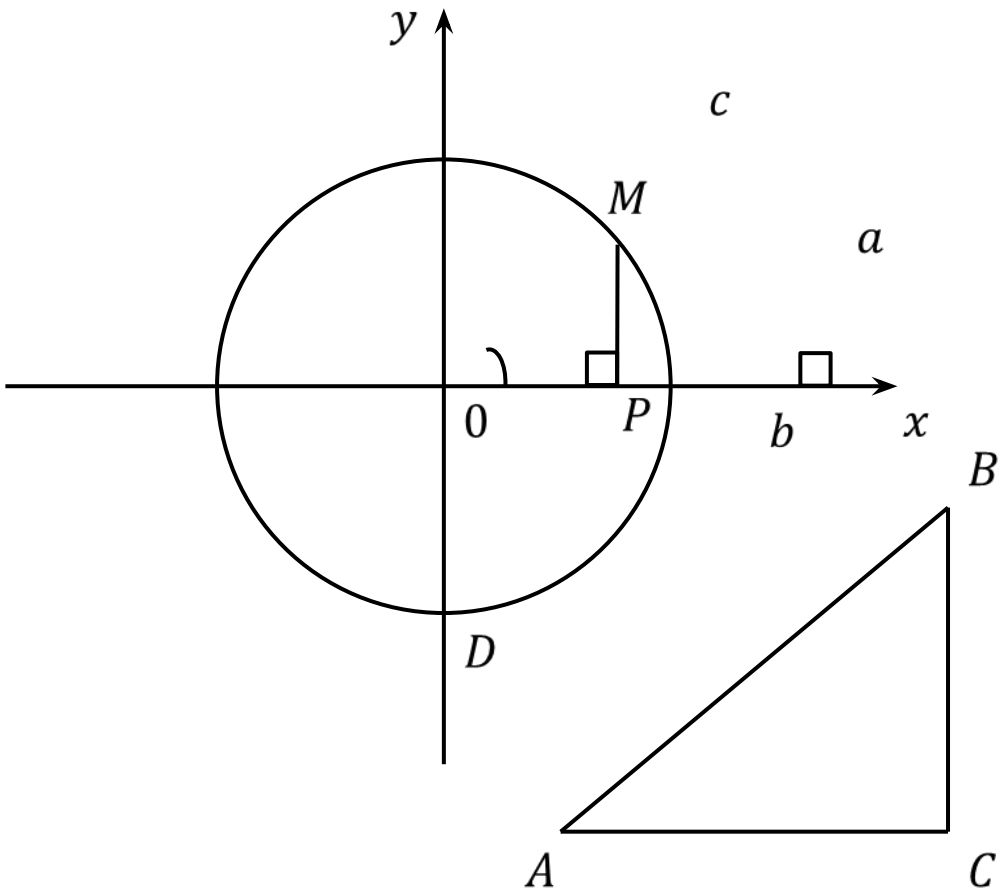


$1°$ $\quad l = \frac{1}{360°} \cdot C$

1 рад $\quad l = r$

1 рад $= \frac{180°}{\pi}$

1 рад $\approx 57{,}3°$



$\Delta AMP \sim \Delta ABC$

$$\frac{MP}{BC} = \frac{AM}{AB} = \frac{AP}{AC}$$

$MP = \sin A\,, OP = \cos A$

$AM = 1, BC = a, AC = b$

$$\frac{\sin A}{a} = \frac{1}{c} = \frac{\cos A}{b}$$

$$\frac{\sin A}{a} = \frac{1}{c} \Rightarrow \sin A = \frac{a}{c}$$

$$\frac{\cos A}{b} = \frac{1}{c} \Rightarrow \cos A = \frac{b}{c}$$

$$tg\ A = \frac{a}{b} \qquad ctg\ A = \frac{b}{a}$$

Упражнения:

1.Переведите из градусной меры в радианную:
а) 150°, б) 330°.

2.Переведите из радианной меры в градусную:
а) $\frac{3\pi}{4}$, б) $\frac{7\pi}{12}$.