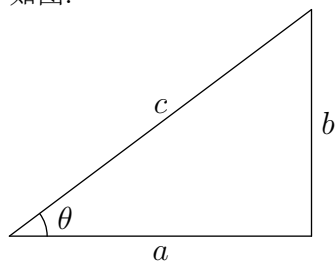


如图.



基本公式列表:

$$\begin{aligned} \sin(\theta) &= \frac{b}{c} & \cos(\theta) &= \frac{a}{c} & \tan(\theta) &= \frac{b}{a} \\ \csc(\theta) &= \frac{1}{\sin(\theta)} = \frac{c}{b} & \sec(\theta) &= \frac{1}{\cos(\theta)} = \frac{c}{a} & \cot(\theta) &= \frac{1}{\tan(\theta)} = \frac{a}{b} \end{aligned}$$

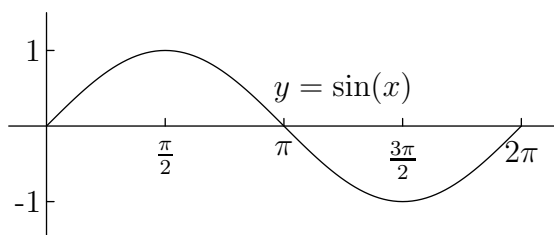
常见三角函数值:

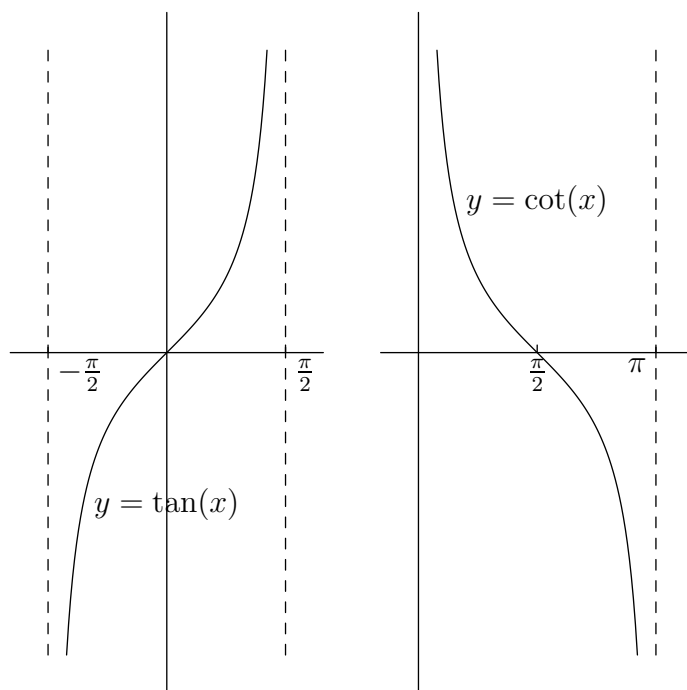
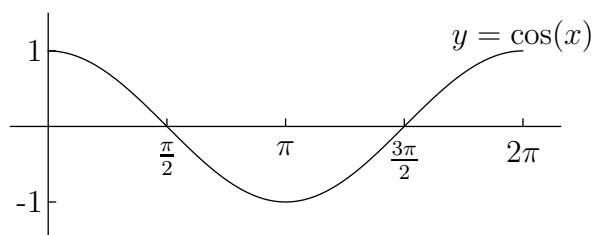
	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
sin	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
tan	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	*

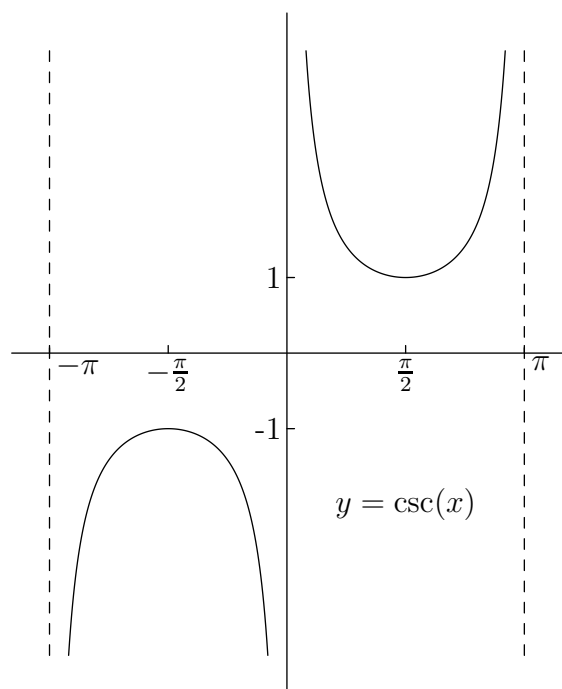
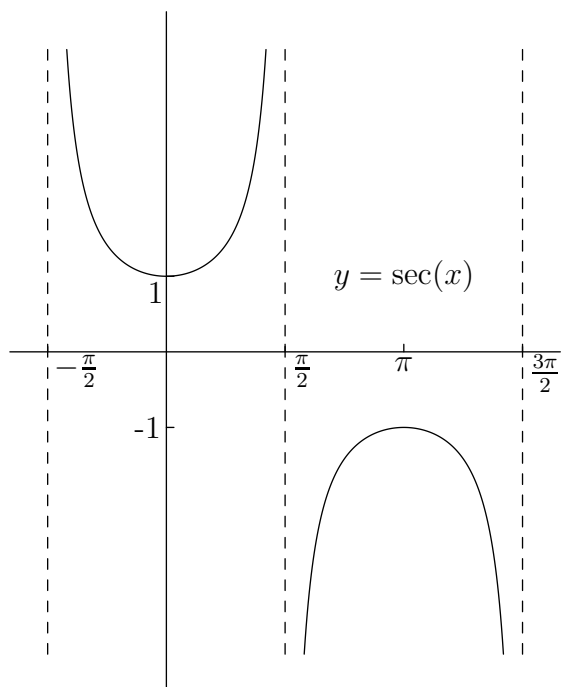
求三角函数值步骤:

1. 找出角所在象限;
2. 当角在 x/y 轴上, 参考三角函数图像;
3. 如果角不在 x/y 轴上, 找出该角与 x 轴形成的最小角度, 即**参考角**;
4. 当参考角为特殊角时, 参考常见三角函数值表;
5. 利用 ASTC(all/sin/tan/cos) 决定是否需要添加负号.

三角函数图像:







毕达哥拉斯定理:

$$\cos^2(x) + \sin^2(x) = 1$$

等式两边除以 $\cos^2(x)$:

$$1 + \tan^2(x) = \sec^2(x)$$

等式两边除以 $\sin^2(x)$:

$$\cot^2(x) + 1 = \csc^2(x)$$

余角公式:

$$\begin{aligned} \cos(x) &= \sin\left(\frac{\pi}{2} - x\right), \cot(x) = \tan\left(\frac{\pi}{2} - x\right), \csc(x) = \sec\left(\frac{\pi}{2} - x\right) \\ \sin(x) &= \cos\left(\frac{\pi}{2} - x\right), \tan(x) = \cot\left(\frac{\pi}{2} - x\right), \sec(x) = \csc\left(\frac{\pi}{2} - x\right) \end{aligned}$$

和/差角公式:

$$\begin{aligned} \sin(A + B) &= \sin(A) \cos(B) + \cos(A) \sin(B) \\ \cos(A + B) &= \cos(A) \cos(B) - \sin(A) \sin(B) \\ \sin(A - B) &= \sin(A) \cos(B) - \cos(A) \sin(B) \\ \cos(A - B) &= \cos(A) \cos(B) + \sin(A) \sin(B) \end{aligned}$$

倍角公式:

$$\begin{aligned} \sin(2x) &= 2 \sin(x) \cos(x) \\ \cos(2x) &= \cos^2(x) - \sin^2(x) = 2 \cos^2(x) - 1 = 1 - 2 \sin^2(x) \end{aligned}$$

公式汇总:

毕达哥拉斯定理:

$$\cos^2(x) + \sin^2(x) = 1$$

$$1 + \tan^2(x) = \sec^2(x)$$

$$\cot^2(x) + 1 = \csc^2(x)$$

余角公式:

$$\cos(x) = \sin\left(\frac{\pi}{2} - x\right), \cot(x) = \tan\left(\frac{\pi}{2} - x\right), \csc(x) = \sec\left(\frac{\pi}{2} - x\right)$$

$$\sin(x) = \cos\left(\frac{\pi}{2} - x\right), \tan(x) = \cot\left(\frac{\pi}{2} - x\right), \sec(x) = \csc\left(\frac{\pi}{2} - x\right)$$

和/差角公式:

$$\sin(A + B) = \sin(A) \cos(B) + \cos(A) \sin(B)$$

$$\cos(A + B) = \cos(A) \cos(B) - \sin(A) \sin(B)$$

$$\sin(A - B) = \sin(A) \cos(B) - \cos(A) \sin(B)$$

$$\cos(A - B) = \cos(A) \cos(B) + \sin(A) \sin(B)$$

倍角公式:

$$\sin(2x) = 2 \sin(x) \cos(x)$$

$$\cos(2x) = \cos^2(x) - \sin^2(x) = 2 \cos^2(x) - 1 = 1 - 2 \sin^2(x)$$