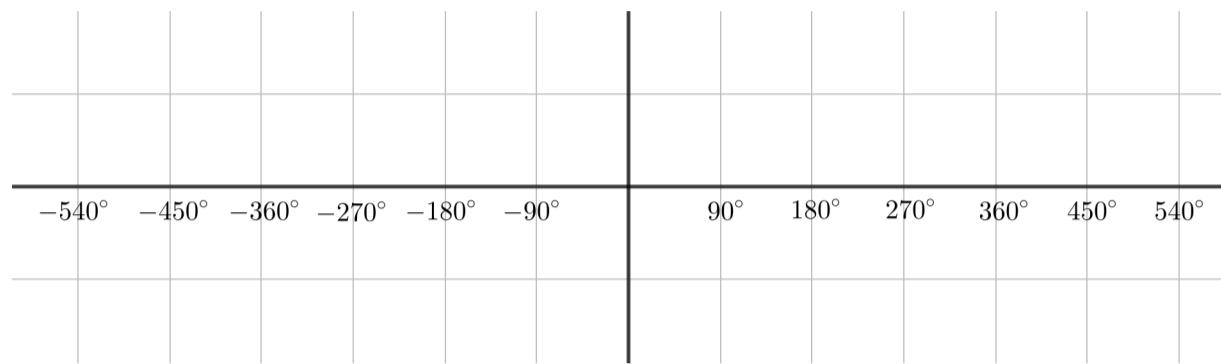


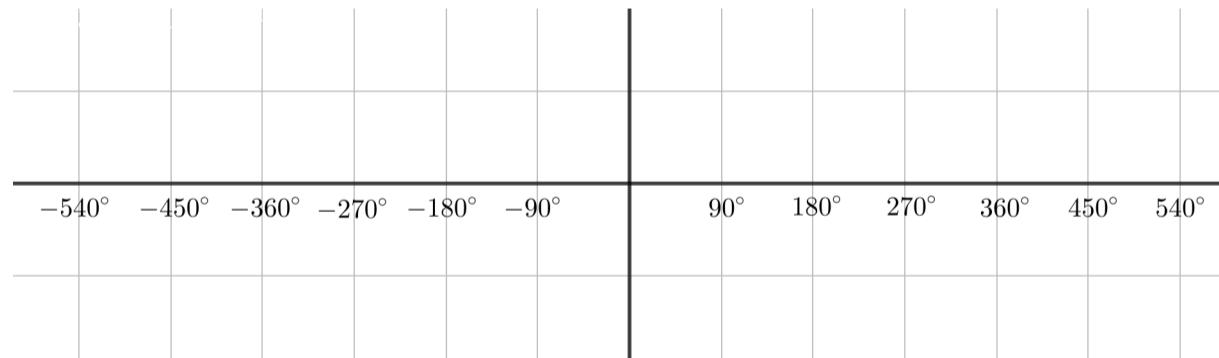
## Relationships between circular functions

Draw the following graphs:

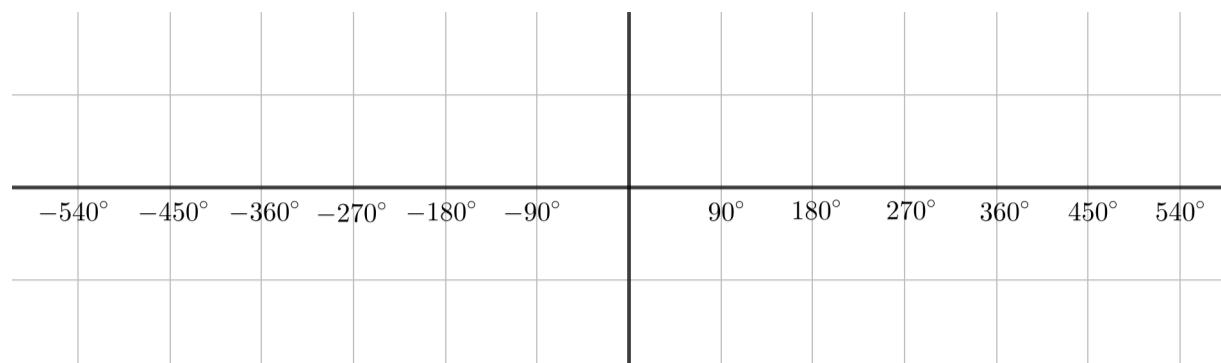
$$y = -\sin x$$



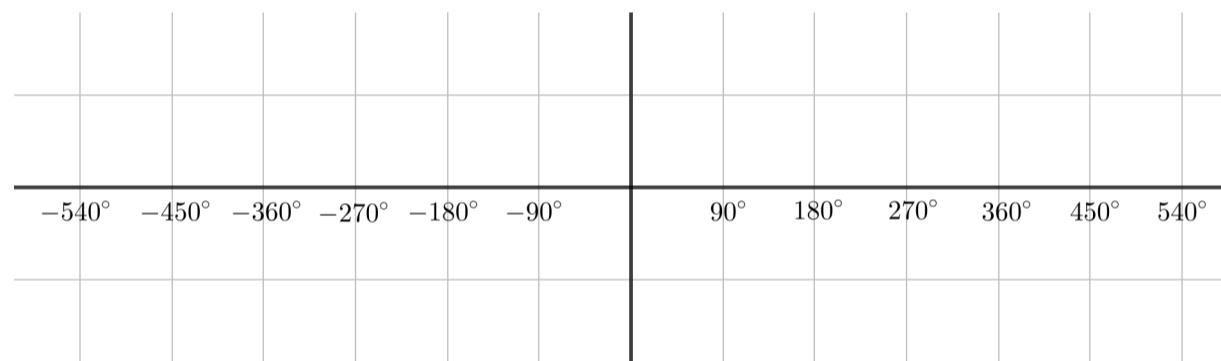
$$y = \sin(-x)$$



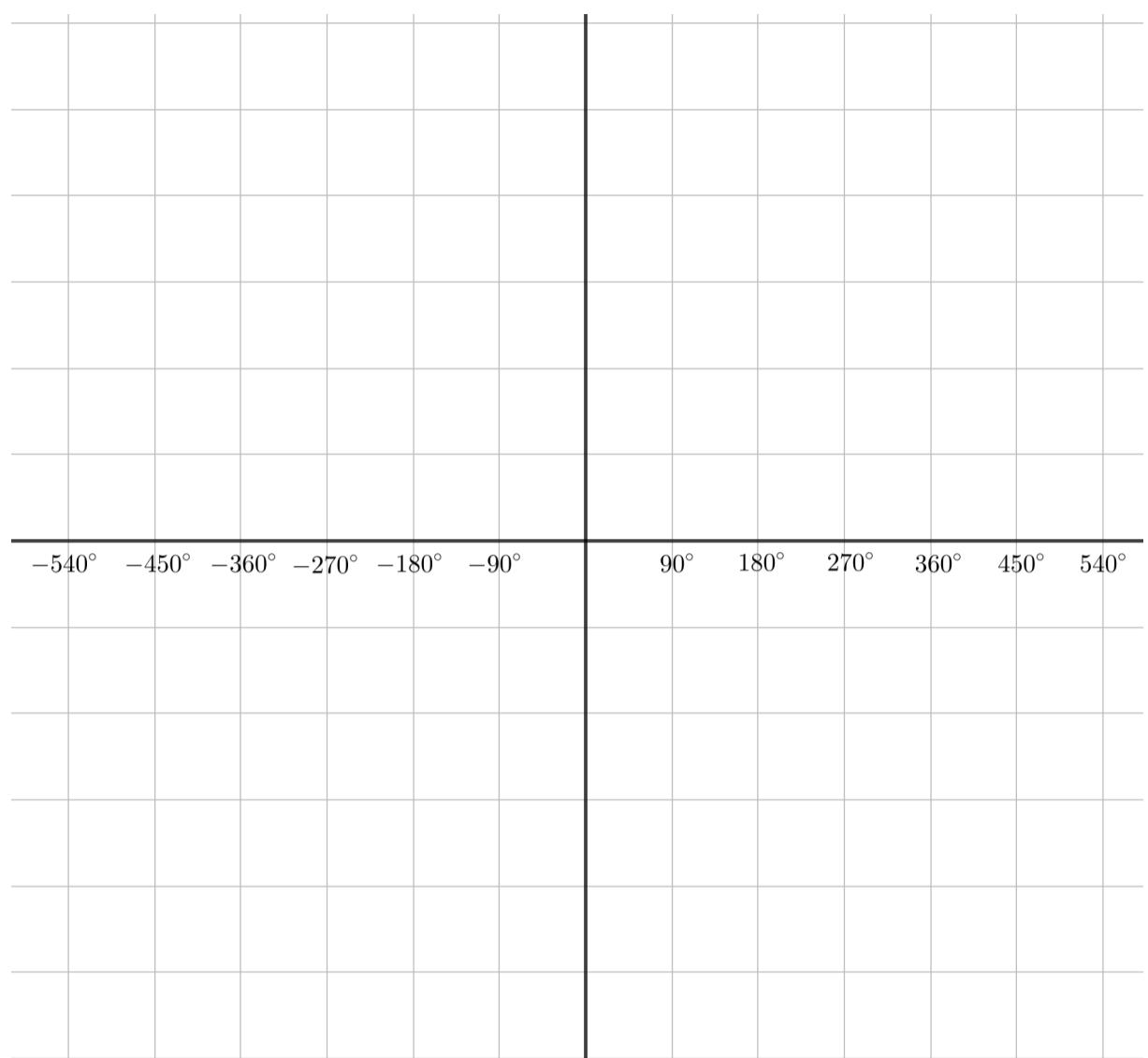
$y = -\cos x$



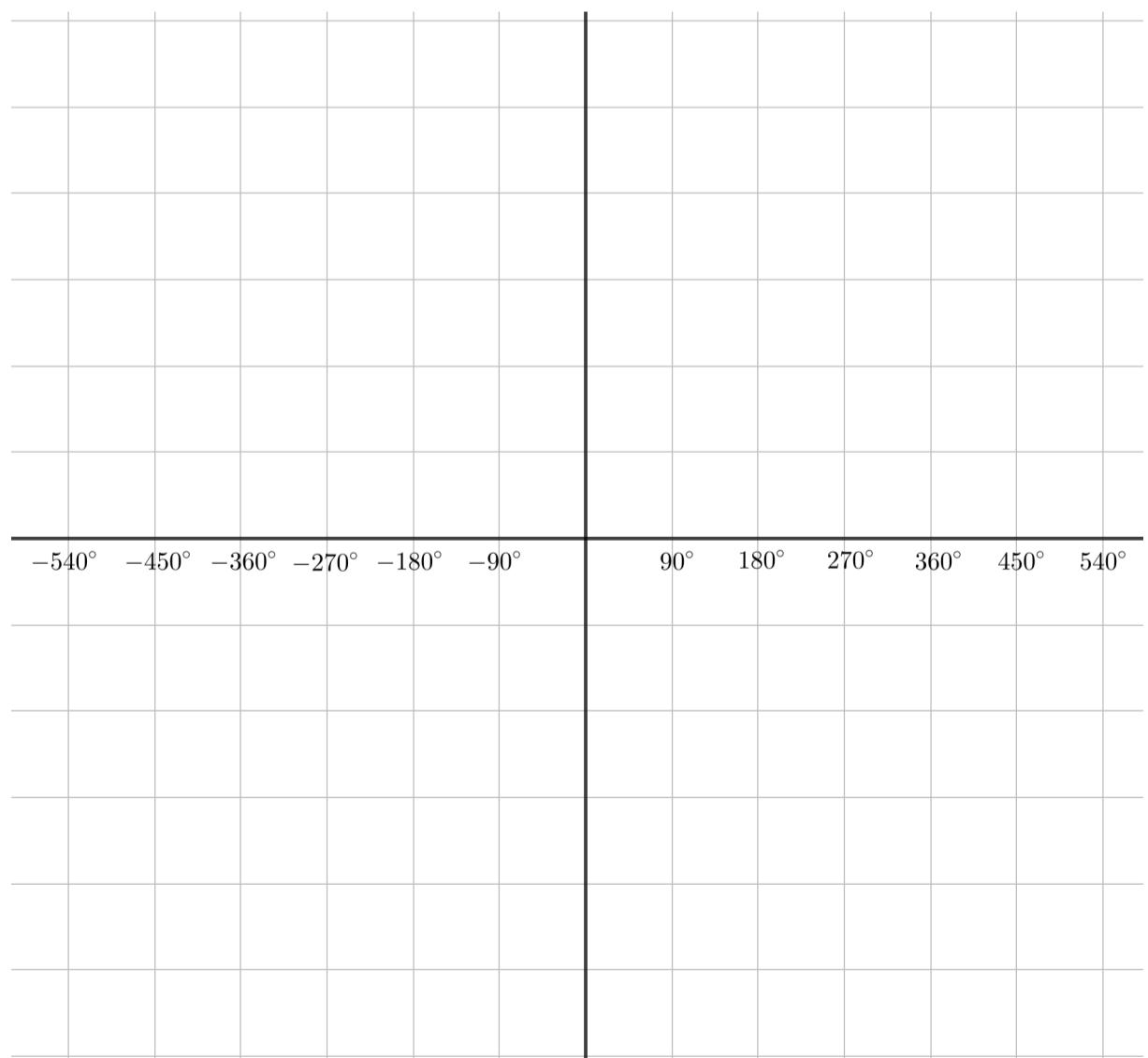
$y = \cos(-x)$



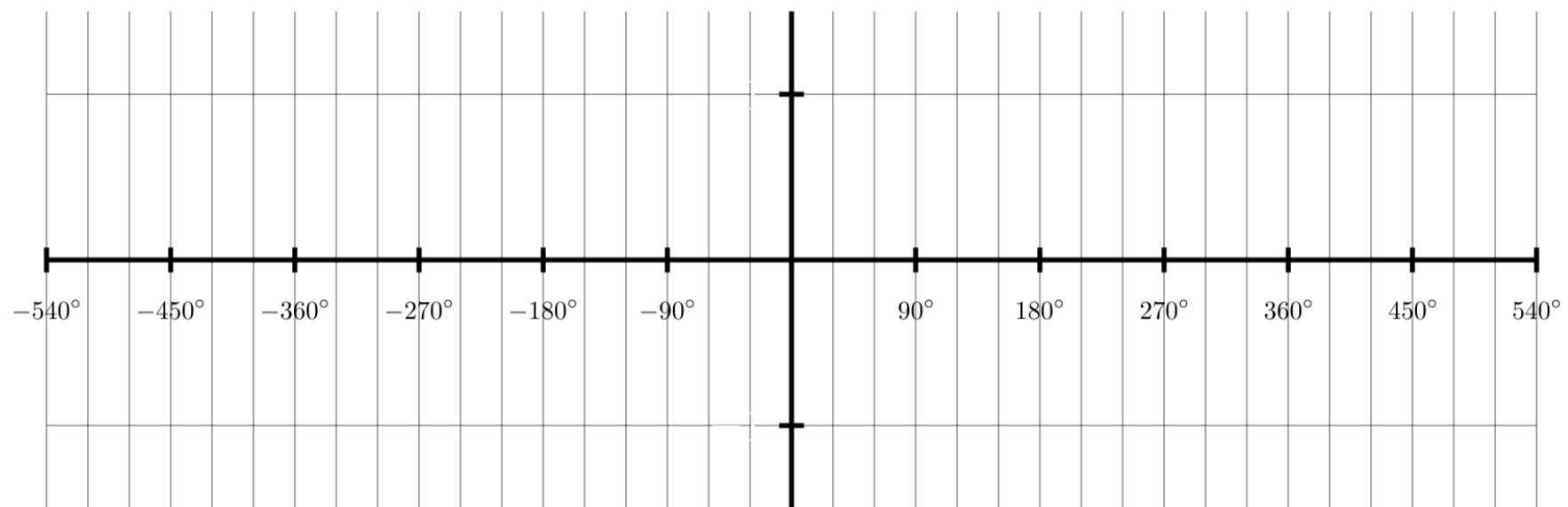
$y = -\tan x$



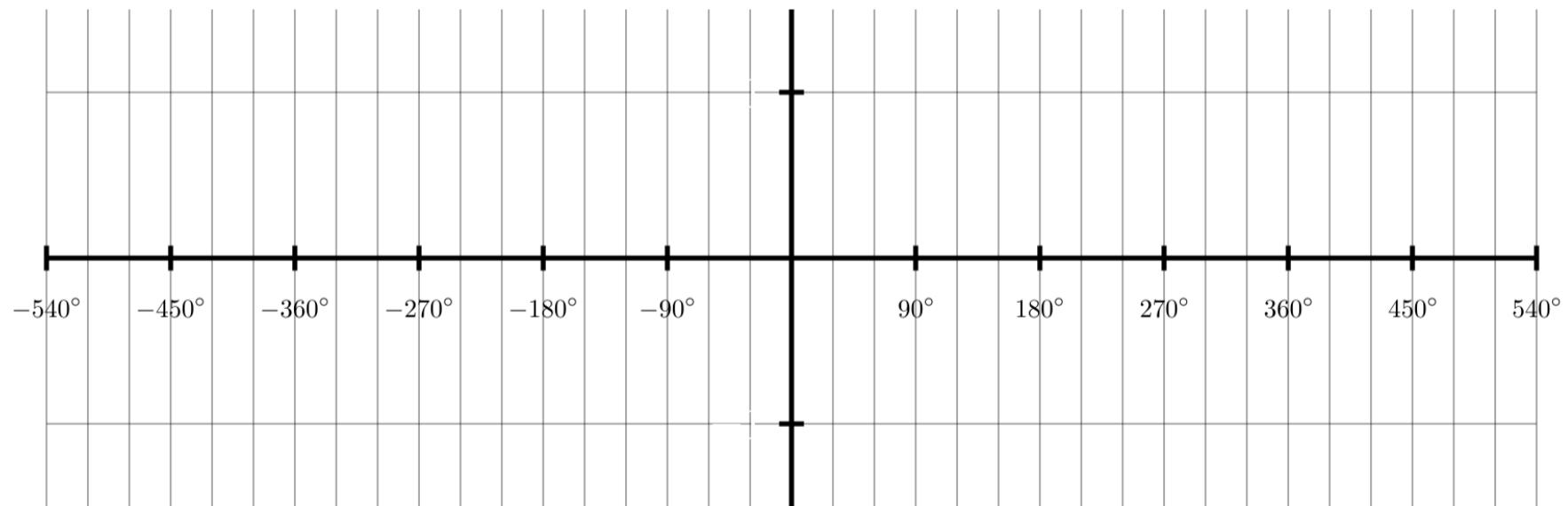
$y = \tan(-x)$



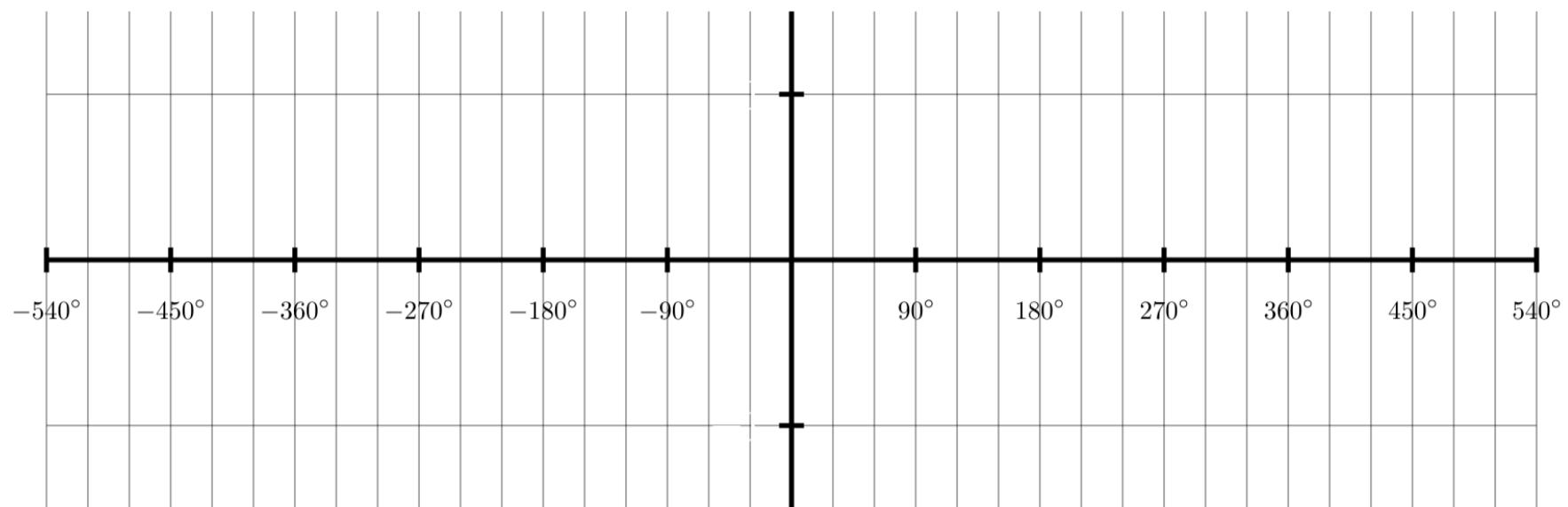
$$y = \sin(90^\circ - x)$$



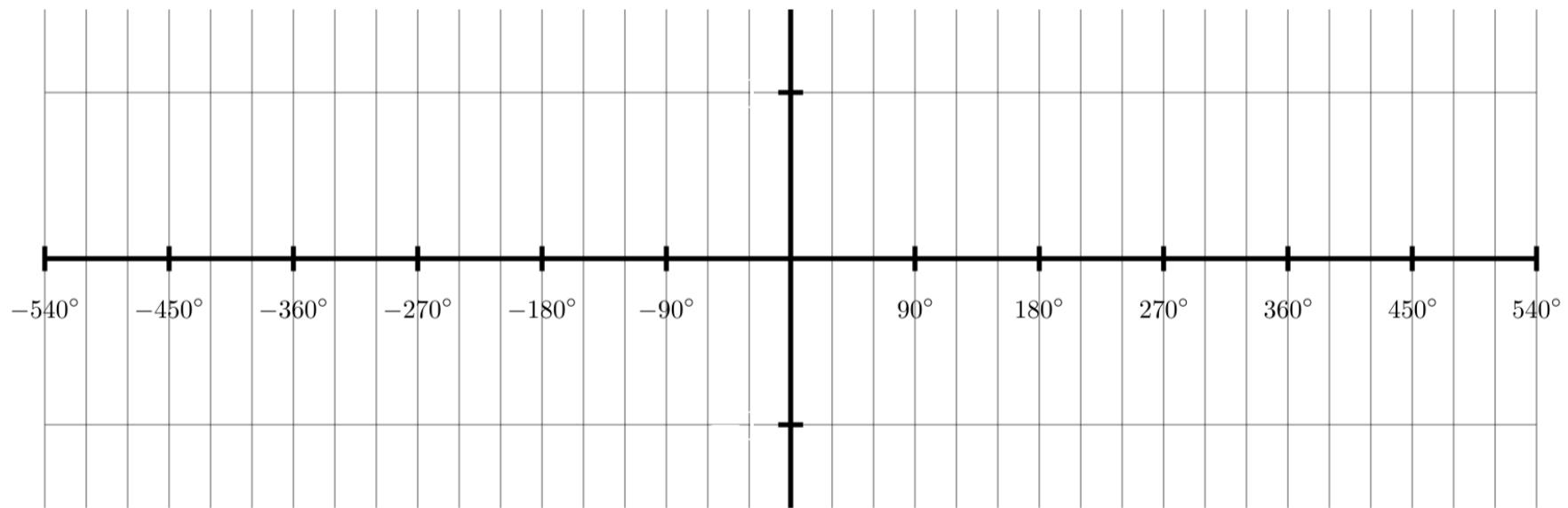
$$y = \cos(90^\circ - x)$$



$$y = \sin(90^\circ + x)$$



$$y = \cos(90^\circ + x)$$



Use these graphs to find some relationships between sin and cos.

Show that

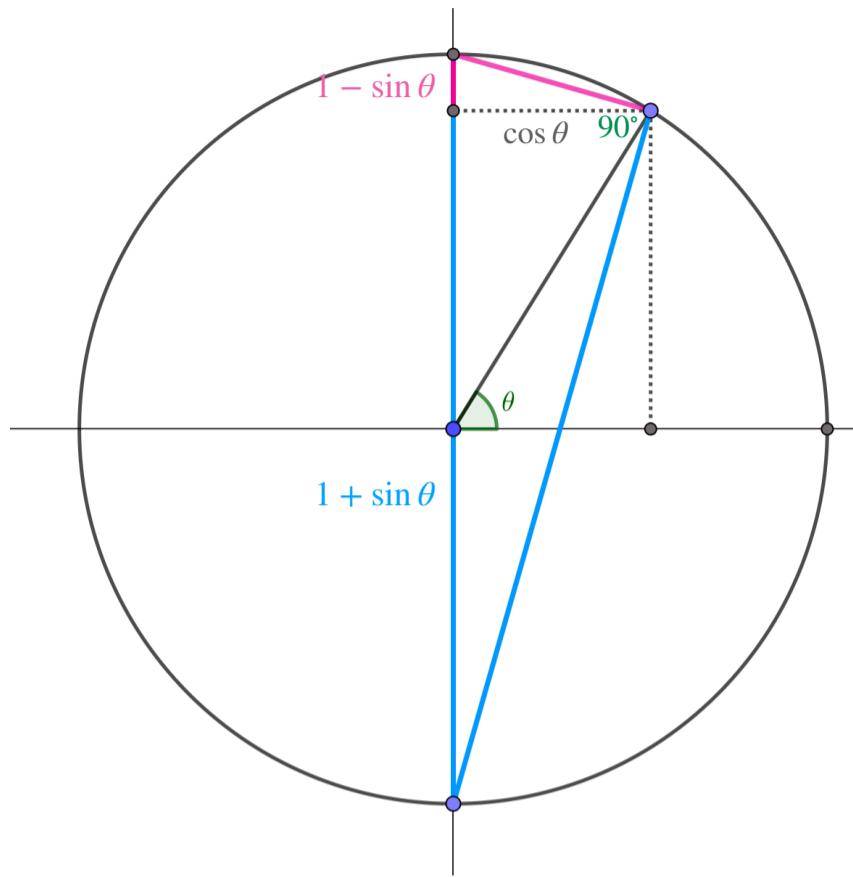
$$\tan \theta + \frac{1}{\tan \theta} = \frac{1}{\sin \theta \cos \theta}$$

whenever  $\theta$  is not a multiple of  $90^\circ$ .

Show that

$$\frac{\cos \theta}{1 + \sin \theta} = \frac{1 - \sin \theta}{\cos \theta}$$

whenever  $\theta$  is not a multiple of  $90^\circ$ .



Show that

$$\frac{\sin \theta - \cos \theta + 1}{\sin \theta + \cos \theta - 1} \equiv \frac{1 + \sin \theta}{\cos \theta}$$

Show that

$$\frac{\sin \theta - \cos \theta + 1}{\sin \theta + \cos \theta - 1} \equiv \frac{1 + \sin \theta}{\cos \theta}$$