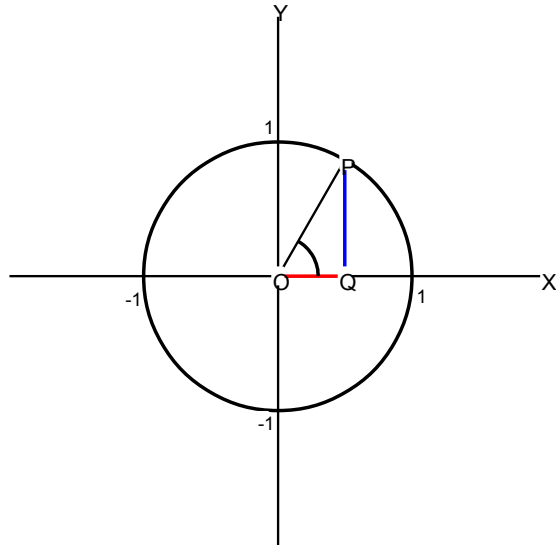


Sine, Cosine and Tangent for angles of any size

OP is a line 1 unit long which rotates around the origin O.

The angle through which it has rotated is measured anti-clockwise from the positive x-axis.



Definitions:

When the line has rotated through an angle of θ ,

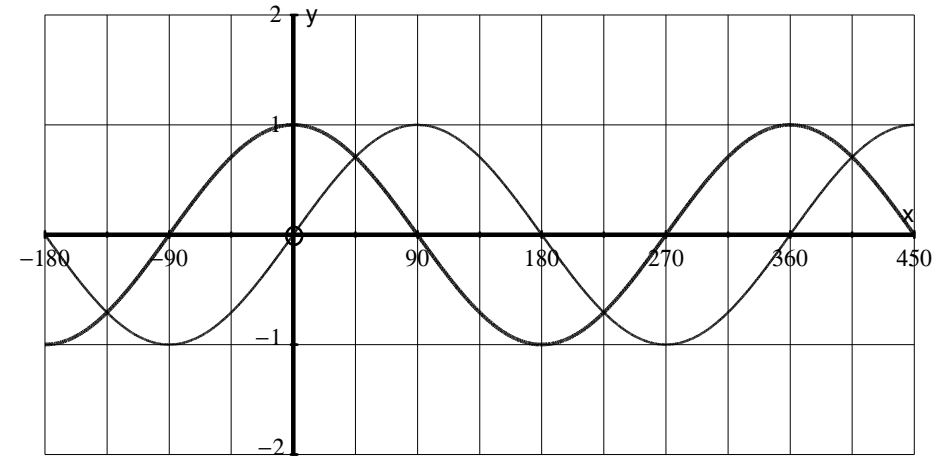
$\cos \theta =$ the x-coordinate of P
 $\sin \theta =$ the y-coordinate of P
 $\tan \theta =$ the gradient of line OP

This means that, for an **obtuse** angle, sine is positive but cos and tan are negative.

$\sin \theta = \sin(180 - \theta)$; for example $\sin 30^\circ = 0.5$, so $\sin 150^\circ = 0.5$
 $\cos \theta = -\cos(180 - \theta)$; for example $\cos 40^\circ = 0.766$, so $\cos 140^\circ = -0.766$
 $\tan \theta = -\tan(180 - \theta)$; for example $\tan 45^\circ = 1$, so $\tan 135^\circ = -1$

Graphs of Trigonometric Functions

The graphs of $y = \sin x$ (thinner line) and $y = \cos x$ (thicker line) are shown below:



The graph of $y = \tan x$ is shown below:

