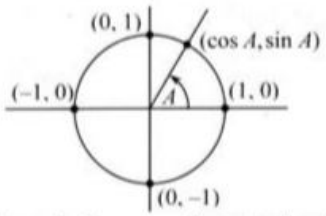
Triantánacht — Trigonometry

$$\tan A = \frac{\sin A}{\cos A} \qquad \cot A = \frac{\cos A}{\sin A}$$

$$\sec A = \frac{1}{\cos A} \qquad \operatorname{cosec} A = \frac{1}{\sin A}$$



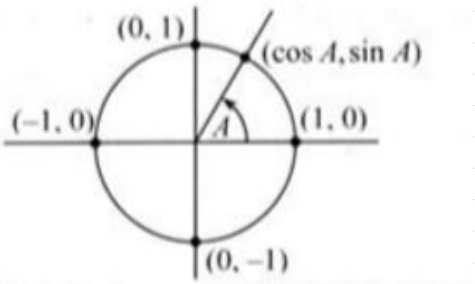
$$\cos^2 A + \sin^2 A = 1$$
$$\sec^2 A = 1 + \tan^2 A$$

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

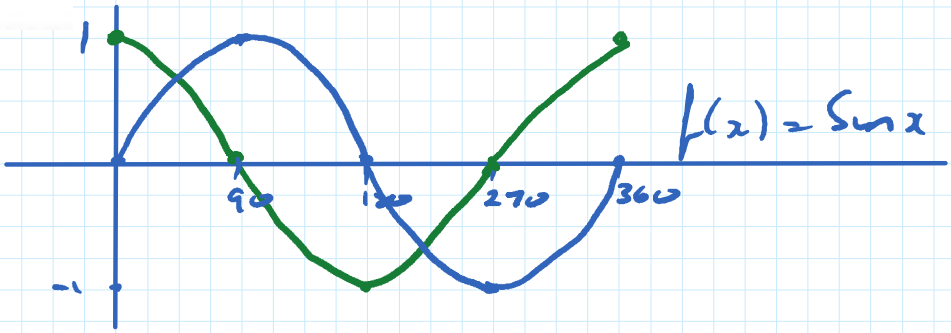
Nóta: Bíonn $\tan A$ agus $\sec A$ gan sainiú nuair $\cos A = 0$.
Bíonn $\cot A$ agus $\operatorname{cosec} A$ gan sainiú nuair $\sin A = 0$.

Note: $\tan A$ and $\sec A$ are not defined when $\cos A = 0$.
$\cot A$ and $\operatorname{cosec} A$ are not defined when $\sin A = 0$.

A (céimeanna)	0°	90°	180°	270°	30°	45°	60°	A (degrees)
A (raidiain)	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	A (radians)
$\cos A$	1	0	−1	0	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$\cos A$
$\sin A$	0	1	0	−1	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	$\sin A$
$\tan A$	0	-	0	-	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	$\tan A$



A	0	90	180	270	360
Sin A	0	1	0	-1	0



$g(x) = \cos x$, $0 \le x \le 360$

Calculator Mode setup 3.

Cos alpha x

Hst = Start 0 Hst =

End 360 Hst = Step 90

Hst =

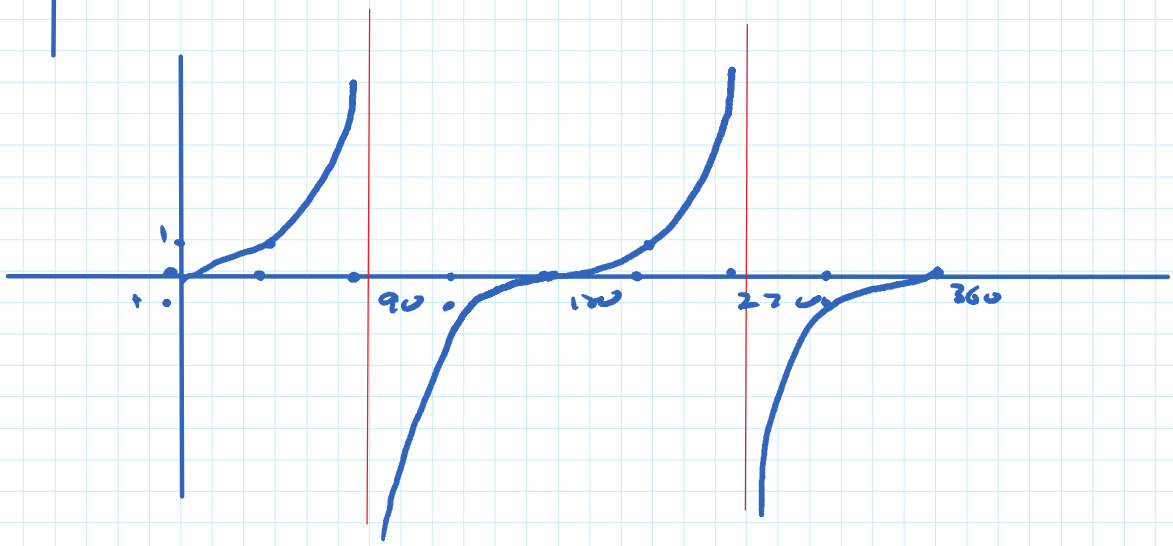
Draw $y = \tan x$ from $0 \leq x \leq 360°$.

$$\tan x = \frac{\sin x}{\cos x}$$

$x = 0$ $\quad \tan 0 = \frac{\sin 0}{\cos 0} = \frac{0}{1} = 0$

$x = 90$ $\quad \tan 90 = \frac{\sin 90}{\cos 90} = \frac{1}{0} = \infty$

x	0	45	90	135	180	225	270	315	360
$\tan x$	0	1	∞	-1	0	1	∞	-1	0



Period and Range.

Period = how much it repeats.

Range = [Lowest, Highest].

$y = \sin x$

Period = 360° or 2π

Range = $[-1, 1]$.

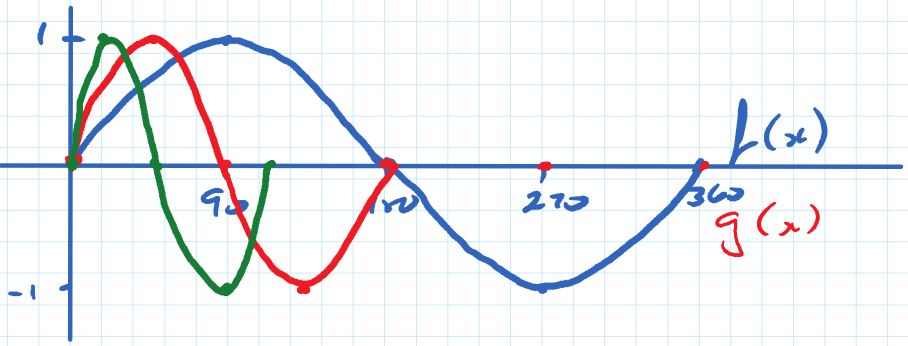
On one diagram draw

$f(x) = \sin x$

$g(x) = \sin 2x$

$h(x) = \sin 3x$ in domain $0 \leq x \leq 360°$

x	0	90	180	270	360
$\sin x$	0	1	0	-1	0



$\sin 2x$ Let $x = 20$.

First $2(20) = 40$

Last $\sin 40 = 0.6$

x	0	45	90	135	180
$2x$	0	90	180	270	360
$\sin 2x$	0	1	0	-1	0

Period = 180

x	0	30	60	90	120
$3x$	0	90	180	270	360
$\sin 3x$	0	1	0	-1	0

Period = 120

$$y = \sin cx$$

$$\text{Period} \quad \frac{360}{c} = \frac{2\pi}{c}$$

$f(x) = \cos x \qquad 0 \le x \le 360°$

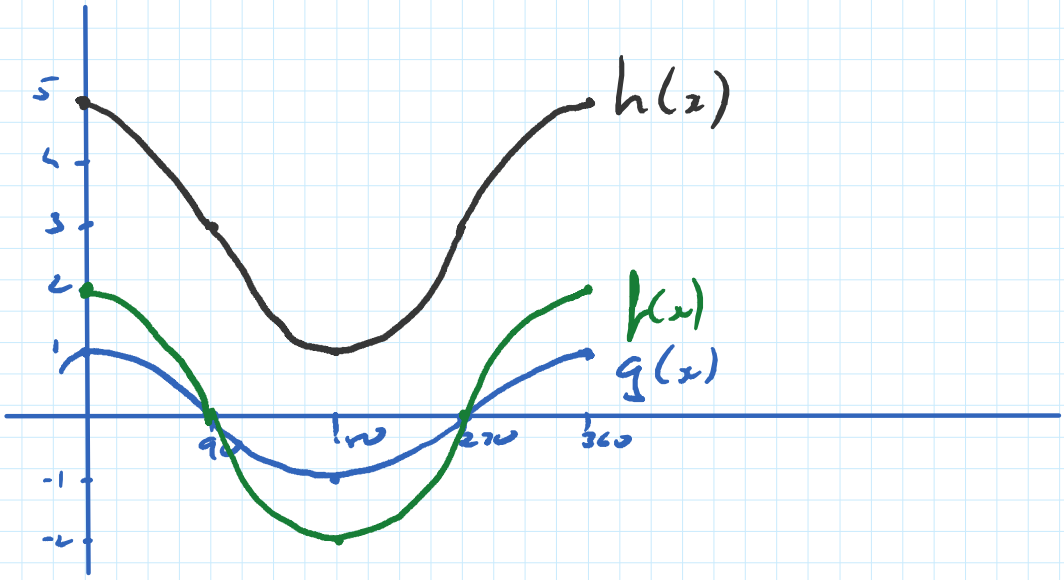
x	0	90	180	270	360
$\cos x$	1	0	-1	0	1

$g(x) = 2\cos x \qquad 0 \le x \le 360°$

x	0	90	180	270	360
$\cos x$	1	0	-1	0	1
$2\cos x$	2	0	-2	0	2

$g(x) = 3 + 2\cos x \qquad 0 \le x \le 360°$

x	0	90	180	270	360
$\cos x$	1	0	-1	0	1
$2\cos x$	2	0	-2	0	2
$3 + 2\cos x$	5	3	1	3	5



$f(x) = a + b\sin cx$

$f(x) = a + b\cos cx$

Period $\frac{360}{c} = \frac{2\pi}{2}$

Range $[a-b,\ a+b]$

Find period and range of

$f(x) = 3 - 5\sin 4x.$

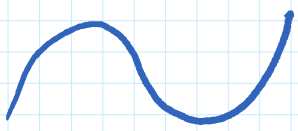
Period $= \frac{360}{4} = 90$

Range $[3-5,\ 3+5]$

$[-2,\ 8]$

Calculator Step $= \frac{\text{Period}}{4}$

Note $\sin x$



$-\sin x$