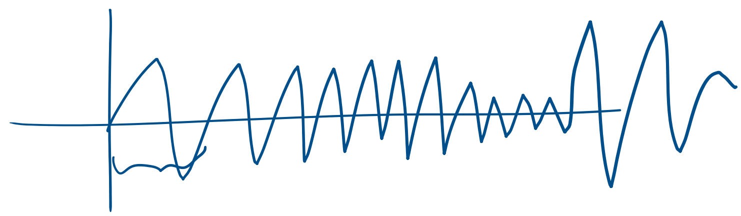
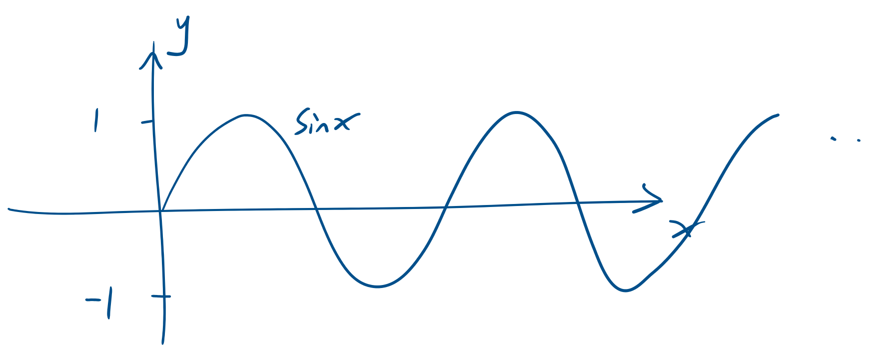
I. Sin x

In applied science, we would consider sinusoidal fct's more often. $\sin\theta$ and $\cos\theta$ are a form of transformation. (It is coverted from the circle.) ← No circle in Physics, Enginnering

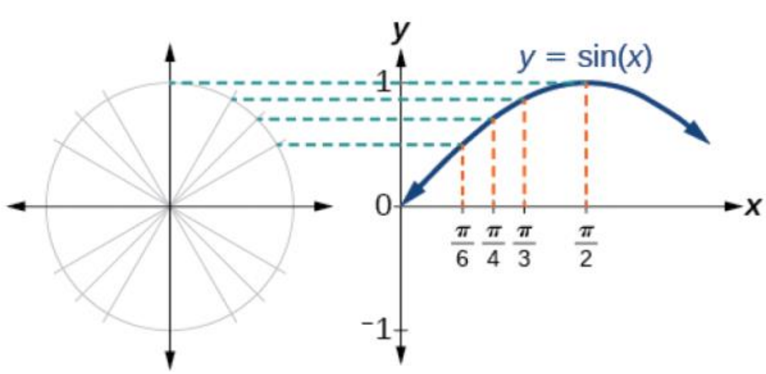
Frequency

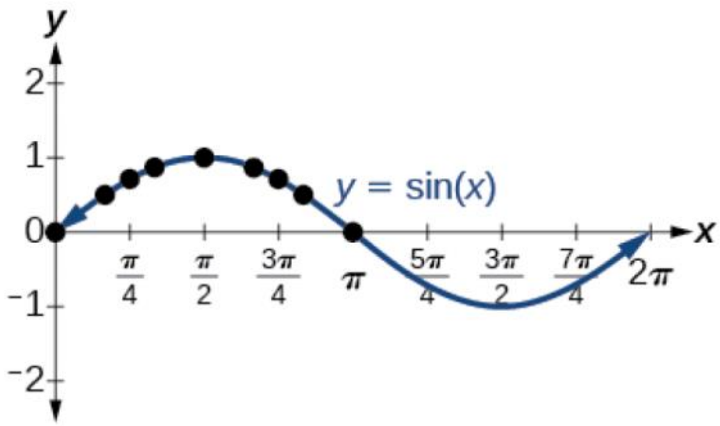


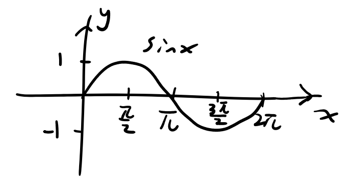
$f = \frac{1}{p}$



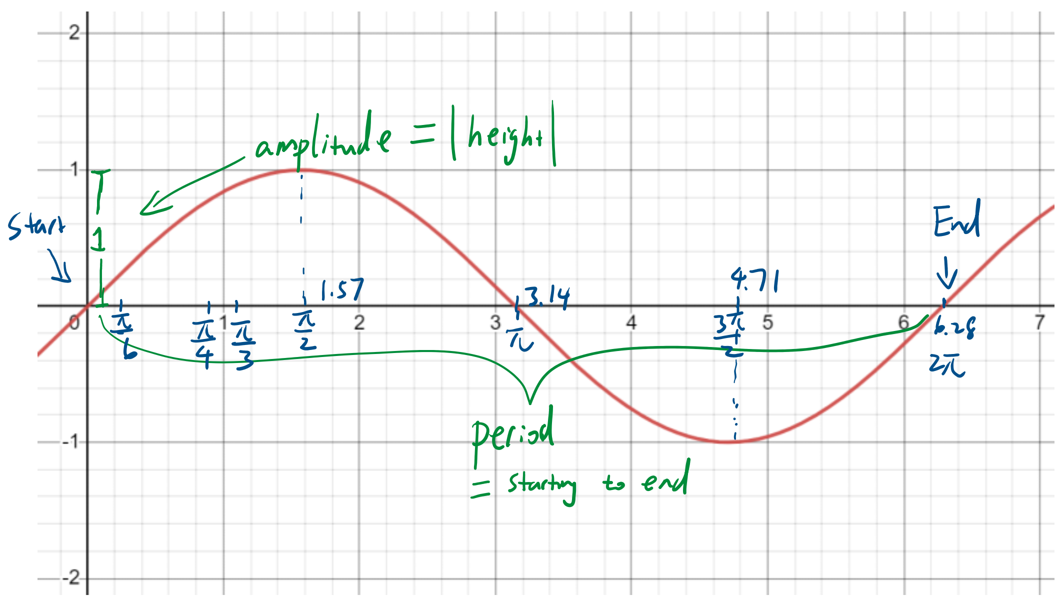
Given that $f(x) = \sin x$, we consider $0 \le x \le 2\pi$. ← a period







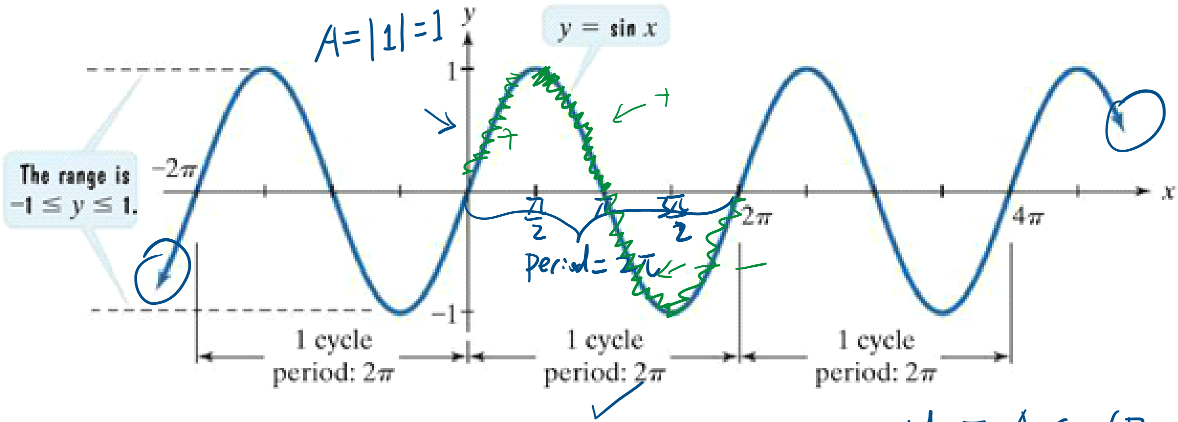
Demos



Important ones :

θ	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	...	π	...	$\frac{3\pi}{2}$	...	2π
$\sin\theta$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1		0		-1		0

remember this, really well!



$y = A\sin(Bx - C) + D$

f(x)

The graph of $y = \sin x$ allows us to visualize some of the properties of the sine function.

- ✓ The domain is $(-\infty, \infty)$, the set of all real numbers. The graph extends indefinitely to the left and to the right with no gaps or holes.
- ✓ The range is $[-1, 1]$, the set of all real numbers between -1 and 1, inclusive. The graph never rises above 1 or falls below -1.
- ✓ The period is 2π. The graph's pattern repeats in every interval of length 2π.
- ✓ The function is an odd function: $\sin(-x) = -\sin x$. This can be seen by observing that the graph is symmetric with respect to the origin.

the point symmetry at point $(\pi, 0)$.

(odd fcts usually a point symmetry)

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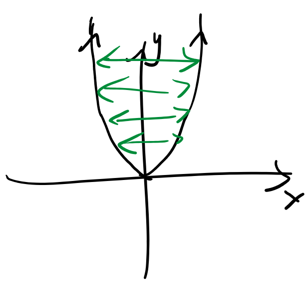
even: $y = x^2$



← Symmetric on y-axis: $x = 0$

(even fcts ually a line symmetry)