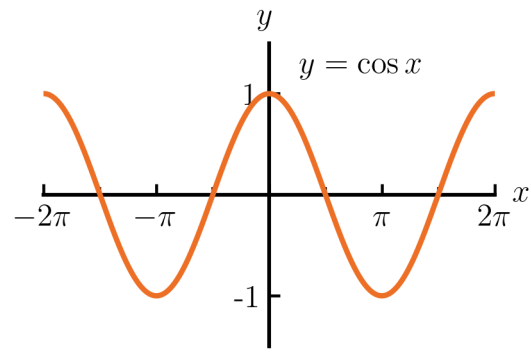
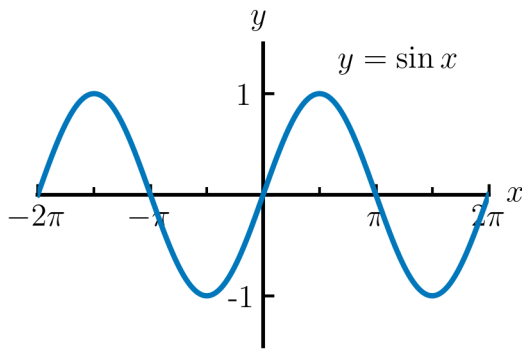


Trigonometric Graphs

In this lesson we will review the graphs of trigonometric functions and explore how transformations affect amplitude and period.



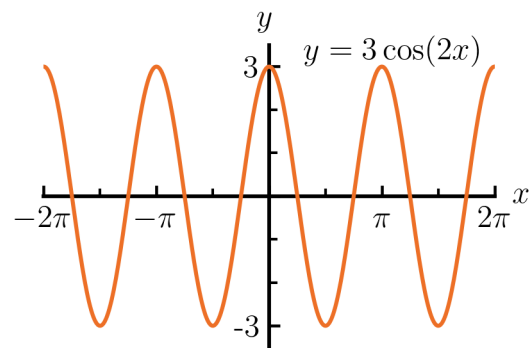
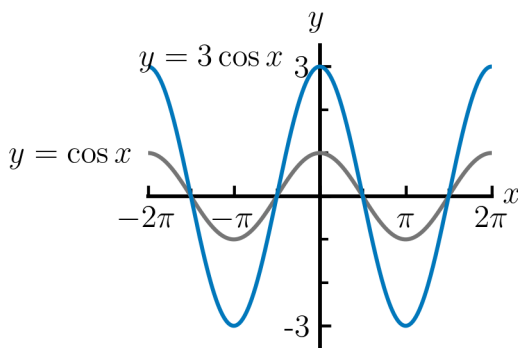
The trigonometric functions are **periodic**, meaning they repeat at regular intervals. Sine and cosine have **period** 2π :

$$\sin(\theta + 2\pi) = \sin(\theta)$$

$$\cos(\theta + 2\pi) = \cos(\theta)$$

Example 1: Graph $y = 3 \cos(2x)$ and find the period and amplitude.

Solution:

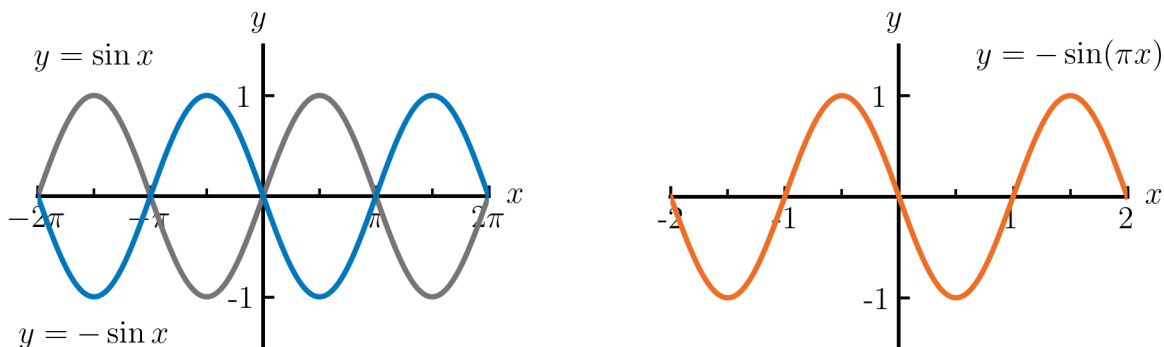


From $y = \cos x$, the graph stretches vertically by a factor of 3, and shrinks horizontally by a factor of 2.

The amplitude is 3, and the period is $\frac{2\pi}{2} = \pi$.

Example 2: Graph $y = -\sin(\pi x)$ and find the period and amplitude.

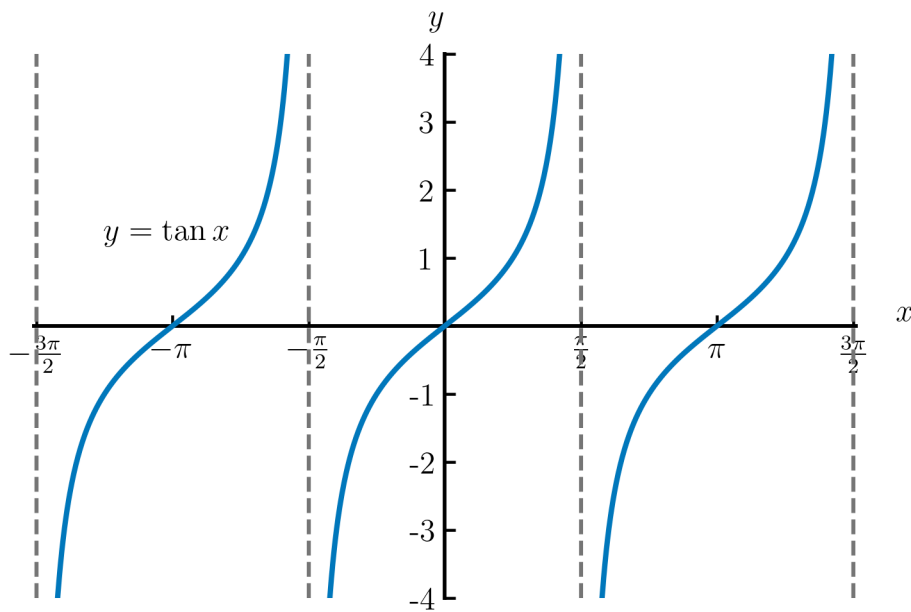
Solution:



From $y = \sin x$, reflect the graph across the x -axis, and shrink horizontally by a factor of π .

The amplitude is still 1. The period is $\frac{2\pi}{\pi} = 2$.

Here is the graph of $y = \tan x$.



Tangent has period π :

$$\tan(\theta + \pi) = \tan(\theta)$$