

Precalculus - Graphs of Trigonometric Functions - Worksheet

Common Core F-TF.B.5, F-IF.C.7e, F-TF.B.7 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

These 20 problems practice graphs of trigonometric functions (Common Core F-TF.B.5, F-IF.C.7e and F-TF.B.7). You will find amplitude, period, phase shift and midline, graph sine, cosine and tangent, and build periodic models.

Precalculus · Common Core State Standards: **F-TF.B.5, F-IF.C.7e, F-TF.B.7**

Exercise 1 - Amplitude and period

Find the amplitude and period of $y = 3\sin 2x$.

Exercise 2 - Reflected cosine

Find the amplitude and period of $y = -\frac{1}{2}\cos\frac{x}{3}$, and tell whether it is reflected.

Exercise 3 - Period with pi in b

Find the period of $y = 4\cos(\pi x)$.

Exercise 4 - Phase shifts

Find the phase shift of (a) $y = \sin\left(x - \frac{\pi}{3}\right)$; (b) $y = \cos(2x + \pi)$.

Exercise 5 - Midline and range

Find the midline and range of $y = 2\sin x - 3$.

Exercise 6 - Write an equation

Write a sine function with amplitude 2, period π , midline $y = 1$ and no phase shift.

Exercise 7 - Evaluate

Evaluate $y = 3\sin 2x$ at $x = \frac{\pi}{4}$ and $x = \frac{\pi}{6}$.

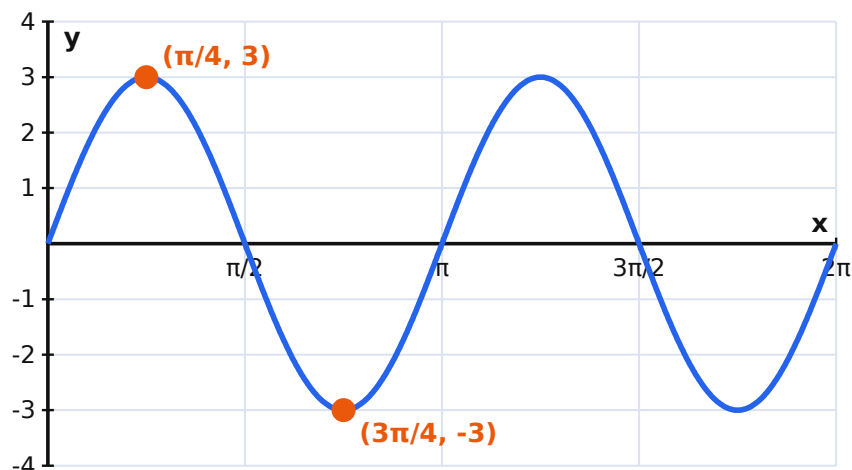
Exercise 8 - Table of values

x	0	$\pi/3$	$\pi/2$	π
$2\cos x$	?	?	?	?

Complete the table.

Complete the table for $y = 2\cos x$.

Exercise 9 - Read a graph



Graph of a sine curve.

The graph of $y = 3\sin 2x$ is shown. State the amplitude, the period and the coordinates of the first maximum.

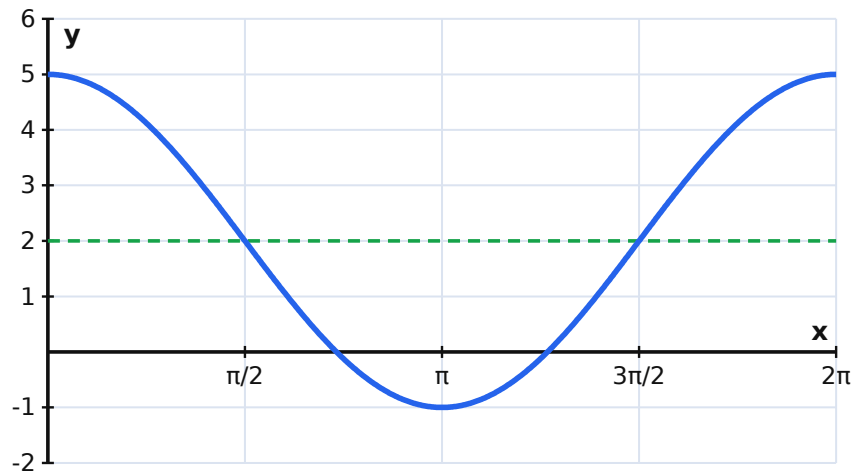
Exercise 10 - Tangent with a stretch

Find the period and the asymptotes of $y = \tan \frac{x}{2}$ for $-2\pi < x < 2\pi$.

Exercise 11 - Tangent with compression

Find the period of $y = \tan 2x$ and the asymptote with the smallest positive x .

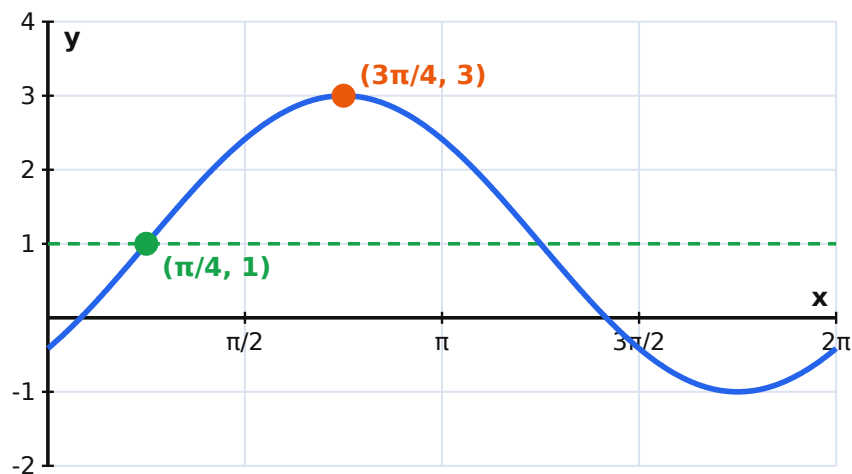
Exercise 12 - Equation from a graph (cosine)



A cosine-shaped graph.

The graph has maximum 5 at $x=0$ and minimum -1 at $x=\pi$. Write a cosine equation.

Exercise 13 - Equation from a graph (shifted sine)



A shifted sine curve.

The sinusoid has midline $y=1$, amplitude 2, period 2π , and crosses the midline going up at $x=\frac{\pi}{4}$. Write a sine equation.

Exercise 14 - Range

Find the range of $y = -4\cos x + 1$.

Exercise 15 - Phase shift identity

Show that $\sin\left(x+\frac{\pi}{2}\right)$ and $\cos x$ give the same value at $x=0$, $\frac{\pi}{3}$ and π .

Exercise 16 - Alternating current

A circuit voltage is $V(t) = 170\sin(120\pi t)$ volts with t in seconds. Find the amplitude, the period and the number of cycles per second.

Exercise 17 - Tide



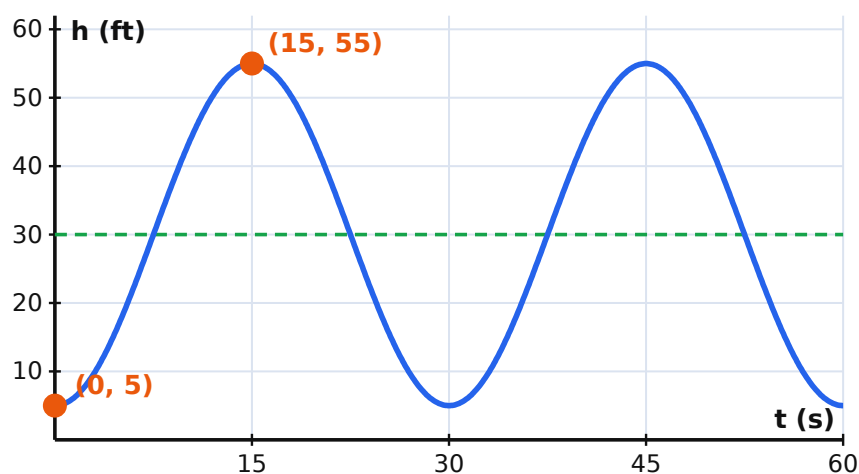
Depth of water at Priya's pier.

The water depth at a pier is $d(t) = 5 + 2\cos\left(\frac{\pi}{6}t\right)$ feet, with t in hours after high tide. Find the high and low depths, the period and the depth at $t = 2$.

Exercise 18 - Daylight hours

The hours of daylight at a city are $D(t) = 12 + 2.5\sin\left(\frac{2\pi}{365}(t - 80)\right)$, with t the day of the year. Find the amplitude, the longest day length, and $D(80)$.

Exercise 19 - Ferris wheel



Height of a rider on a Ferris wheel.

A rider's height is $h(t) = 30 - 25\cos\left(\frac{\pi}{15}t\right)$ feet. Find the lowest and highest heights, the time for one rotation, and the height at $t = 10$ s.

Exercise 20 - A model from data

A sinusoid has maximum 7 at $x = 0$, minimum -1 at $x = 4\pi$. Write a cosine model.