

Graphs & Inverses of Trig Functions

1 – Parent Graphs of Sine & Cosine

Periodic Function

A function in which for some real number α , $f(x + \alpha) = f(x)$ for each x in the domain of f .

$$y = A \sin(k\theta - c) + VD$$

$$y = A \cos(k\theta - c) + VD$$

A

A = the coefficient of the trig function. This determines the vertical stretching and shrinking of a graph. It also determines if the graph is reflected over the midline.

Amplitude

Amplitude of Sine and Cosine = $|A|$ = half the distance between the minimum and maximum values of the range of a periodic function with a bounded range.

Vertical Displacement

VD = the vertical translation

Midline

The horizontal axis used as the reference line about which the graph of a periodic function oscillates.

Period

P = the horizontal length of the unique part of the graph.

Phase Shift

PS = the horizontal translation.

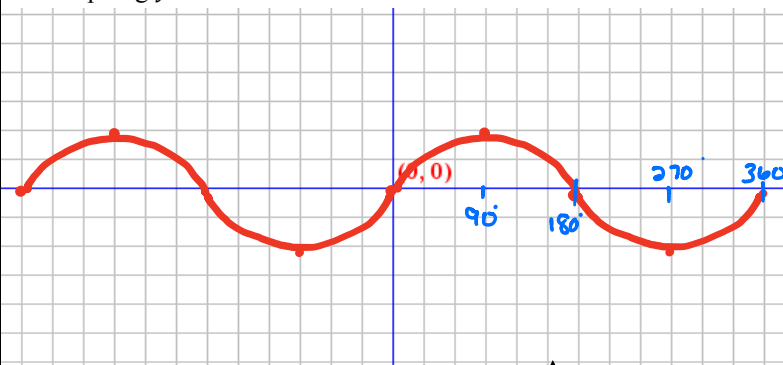
Domain for trig functions

all the angles that can be put into the function (all the numbers included from left to right).

Range for trig functions

all the values that come out of the function (all the numbers included from bottom to top).

Graphing $y = \sin \theta$

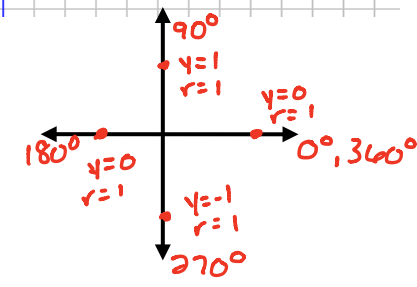


Domain = $(-\infty, \infty)$

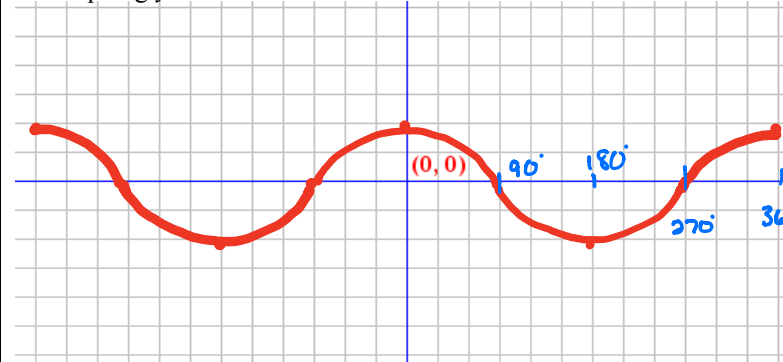
Range = $[-1, 1]$

Period = $360^\circ, 2\pi$

Midline = $y = 0$



Graphing $y = \cos \theta$

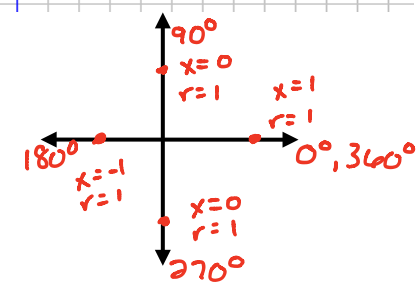


Domain = $(-\infty, \infty)$

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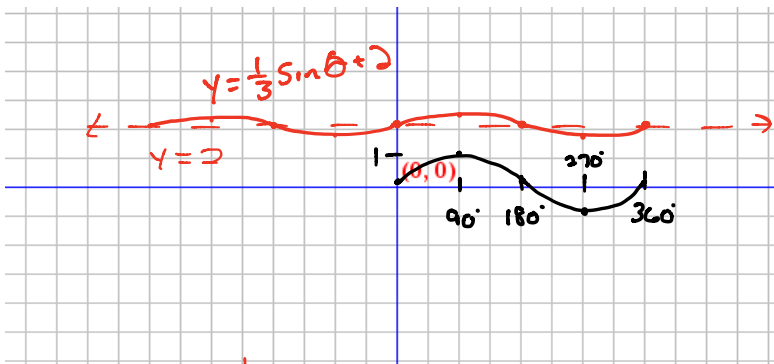


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1 - Parent Graphs of Sine & Cosine

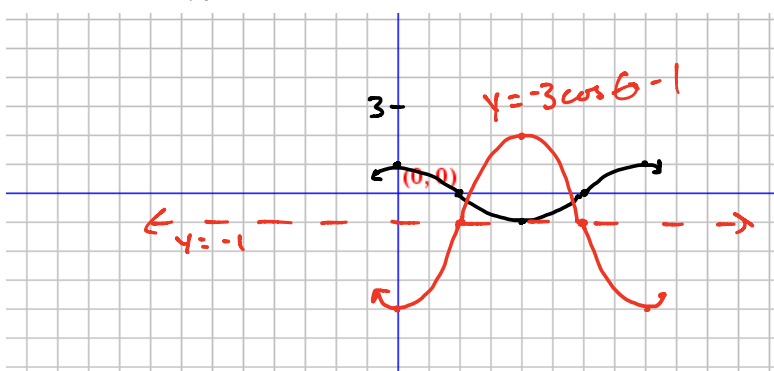
Graph each function and its parent function. Graph a minimum of one period. Use DEGREES.

#1) $y = \frac{1}{3} \sin \theta + 2$



A: $\frac{1}{3}$
 Amplitude: $|\frac{1}{3}| = \frac{1}{3}$
 Reflected over midline? NO
 Vertical Displacement: 2
 Midline: $y=2$
 Phase Shift: 0°
 Period: 360°

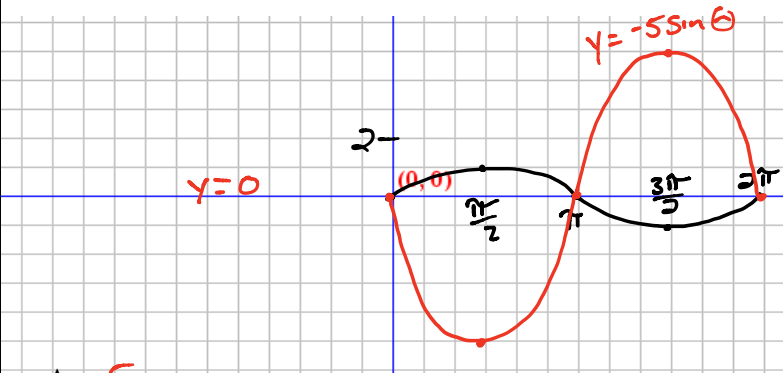
#2) $y = -3 \cos \theta - 1$



A: -3
 Amplitude: $|-3| = 3$
 Reflected over midline? YES
 Vertical Displacement: -1
 Midline: $y=-1$
 Phase Shift: 0°
 Period: 360°

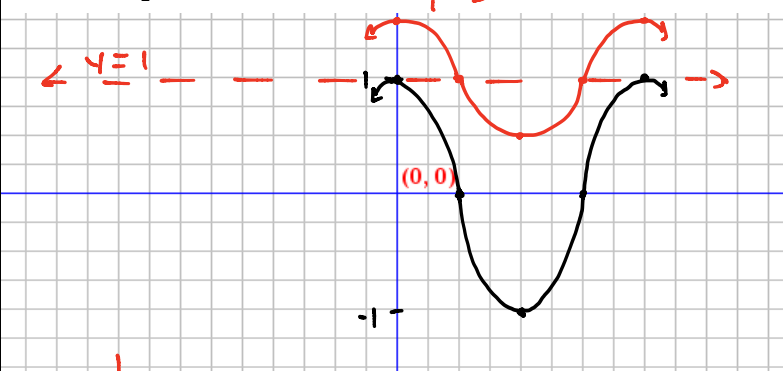
Graph each function and its parent function. Graph a minimum of one period. Use RADIANS

#1) $y = -5 \sin \theta$



A: -5
 Amplitude: $|-5| = 5$
 Reflected over midline? YES
 Vertical Displacement: 0
 Midline: $y=0$
 Phase Shift: 0
 Period: 2π

#2) $y = \frac{1}{2} \cos \theta + 1$



A: $\frac{1}{2}$
 Amplitude: $|\frac{1}{2}| = \frac{1}{2}$
 Reflected over midline? NO
 Vertical Displacement: 1
 Midline: $y=1$
 Phase Shift: 0
 Period: 2π