

Sinusoidal Functions - Engaging Resources

RF SO8 - Sinusoidal Functions Concept Summary Sheet

(Download: [Sinusoidal Concept Map.pdf](#))

This chart may help students see the big picture and the connections within the topic.

Sinusoidal Functions

State characteristics and solve contextual problems when given...

GRAPH

Period = measure of one rotation \sin or \cos or $-\sin$

EQUATION

$y = a \sin(bx + c) + d$

↳ Analyze parameters a, b, d .

- a = amplitude
- $y = d$, equation of median line
- $\frac{2\pi}{b}$ = period
- $d + a$ = maximum
- $d - a$ = minimum

↳ Enter equation in Graphing Calculator and analyze.

- Radian mode, usually
- Use characteristics from parameters to help with Window settings.

TABLE OF VALUES

x							
y							

- Perform a sinusoidal regression with Graphing Calculator.

C: SinReg

 → $y = a \sin(bx + c) + d$

- Use equation from regression to solve problems.

DESCRIPTION

- Use problem description to generate a table of values.
- Use table of values and regression to get an equation.
- Use equation to graph and solve problems.

DESCRIPTION → TABLE OF VALUES → EQUATION → GRAPH

↳ Explain how changes to the context will change the graph of a sinusoidal function.

RF SO8 - Ferris Wheel Investigation

(Download: [FerrisWheelInvestigation.docx](#))

This investigation may assist students in visualizing circular motion and the connection between a sinusoidal equation and graph. The investigation also includes a second Ferris Wheel with differing characteristics from the first.

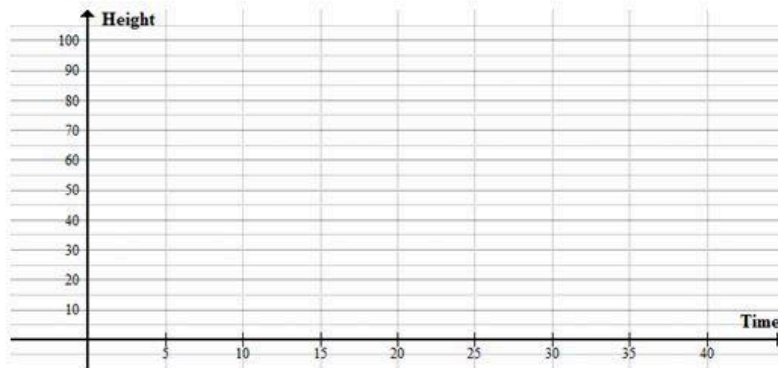
Ferris Wheel #1

A Ferris Wheel has a diameter of 100 meters. It takes 20 minutes to go around the Ferris wheel once. The lowest point, where you enter the Ferris wheel is 0 meters above the ground.

- a) Complete the table of values below showing the height of the Ferris Wheel over time, starting at the lowest point.

Time (min)	0	5	10	15	20	25	30	35	40
Height (m)									

- b) Sketch a scatterplot of the height of the Ferris Wheel over time, based on the table of values.



- c) Use regression to calculate a sinusoidal function that best models this data.

STAT – CALC – C: SinReg $y = a \sin(bx + c) + d$ **Make sure calculator is in Radian Mode!**

Write the regression equation below and sketch the line of best fit on the scatter plot above.

- d) Complete the table below:

From Graph / Description:	From Equation:
radius =	$a =$
average/middle height =	$d =$
time to go around once =	$\frac{2\pi}{b} =$