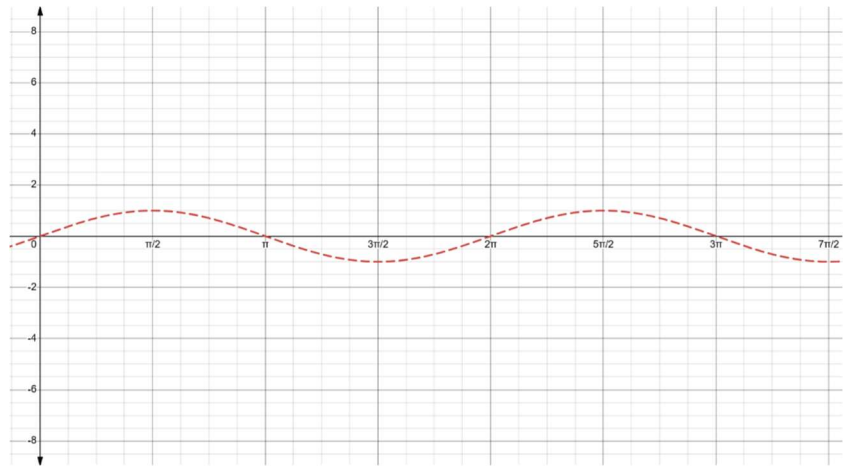


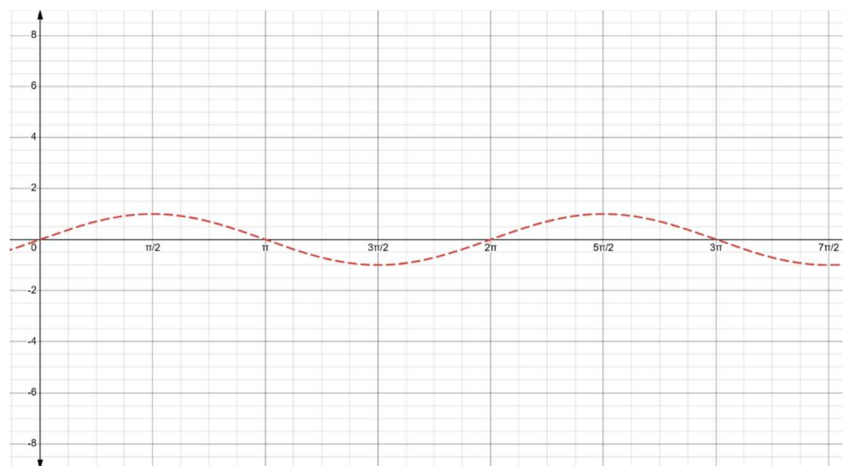
Graph of Sine Function

1. For each function, indicate the amplitude, frequency, period, phase shift, vertical translation, and equation of the midline. Graph the function together with a graph of the sine function $f(x) = \sin(x)$ in red on the same axes. Graph at least one full period of each function:

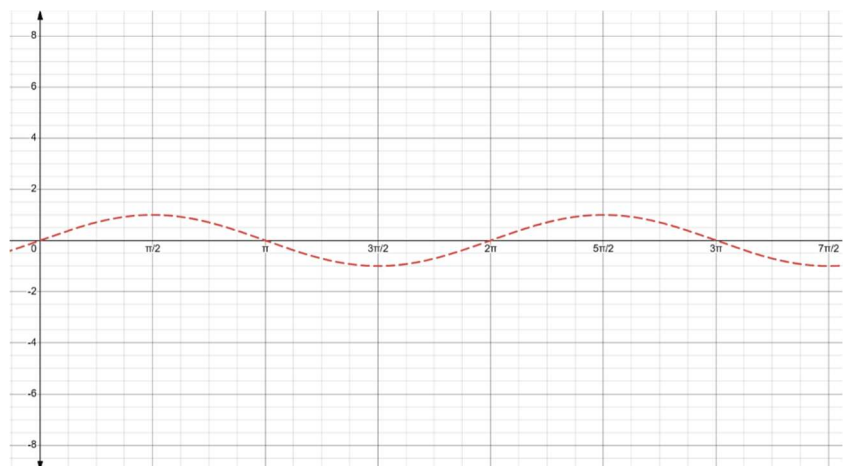
a. $g(x) = 3\sin(2x) + 2$



b. $g(x) = -\sin\left(4x + \frac{\pi}{3}\right) - 2$



c. $g(x) = 2\sin\left(4\left(x - \frac{\pi}{3}\right)\right) + 1$



Month/Year	GENERAL DAM OCCUPANCY RATE (%)
01/2017	70.60
02/2017	86.08
03/2017	88.62
04/2017	87.76
05/2017	84.51
06/2017	79.78
07/2017	74.26
08/2017	66.50
09/2017	58.14
10/2017	54.16
11/2017	55.37
12/2017	57.47
01/2018	68.40
02/2018	77.89
03/2018	89.36
04/2018	90.59
05/2018	87.50
06/2018	82.91
07/2018	76.00
08/2018	67.56
09/2018	58.03
10/2018	53.27
11/2018	48.97
12/2018	69.81

Table 1 Dam Occupancy Rates (%) of each Month between the years 2017-2019

2. The mean of monthly dam occupancy in percentages of Istanbul for 2017-2019 period is given in the table above.

We want to model the data with a trigonometric function of the form $T = a \sin(b(t - c)) + d$ where $01/2017 \equiv 0$, $02/2017 \equiv 1$, and so on.

- Create a scatter plot of the data
- Without using technology, estimate

i. a ii. b iii. c iv. d

- Using the values that you found write the function.

