MATH 111 - Calculus and Analytic Geometry I

Lab 1 Worksheet

Fall 2020 | **Subhadip Chowdhury** | **Aug 25**

Title: Review of Functions IV - Transformations

Summary: We will review how the graph of a function transforms under translation or dilation of the variables.

§A. New Functions from Old

Go to https://www.desmos.com/calculator/wyamilnmwe. Given a graph of $f(x)$, consider the graph of $g(x) = af(bx)$ and $h(x) = f(x+c)+d$. Explore the effect of the constants a, b, c and d on the graph using the sliders and discuss the questions with your group. Change the function $f(x)$ to experiment with other choices.

Question 1.

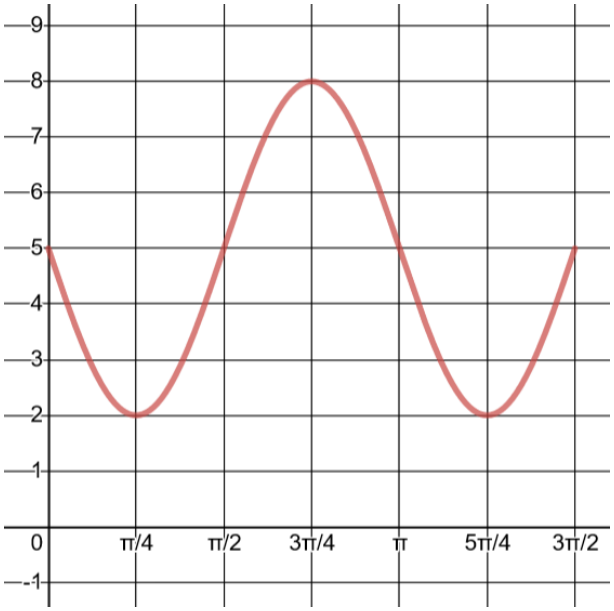

Figure 1

Find equation of a trigonometric function of the form

$$\mathbf{A + B\sin(Cx + D)}$$

whose graph looks like the figure 1. You can use Desmos to check your answer.

[**Hint**: Start with the graph of $\sin(x)$ in Desmos. Use what you learned in the last problem to shift/stretch the graph until you get to figure 1.]

Then discuss the following questions:

(a) How does the period depend on **C**?

(b) How does the amplitude depend on **B**?

(c) What does the constant **A** correspond to in the graph?

(d) What does the constant **D** correspond to in the graph?