Homework #1

PHYS 4D: Modern Physics

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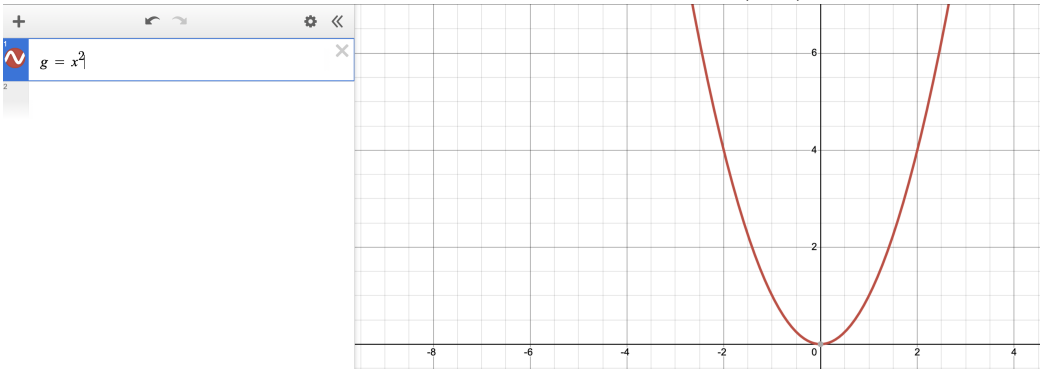
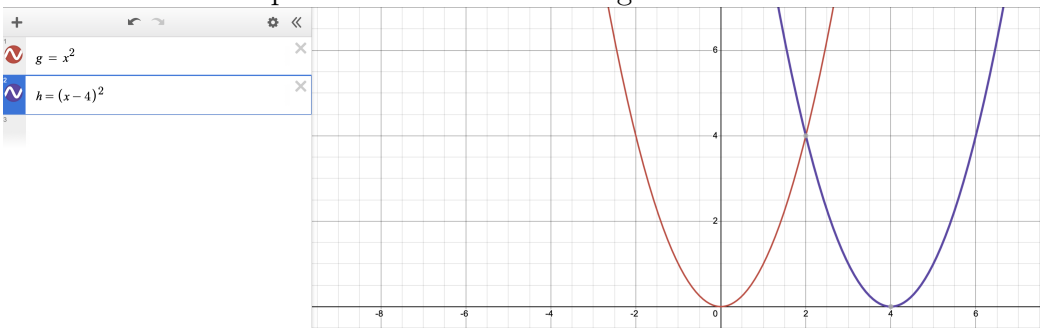
1 Exercise 1

The shape drawn is a parabola with its lowest point at $(0, 0)$, as shown below.

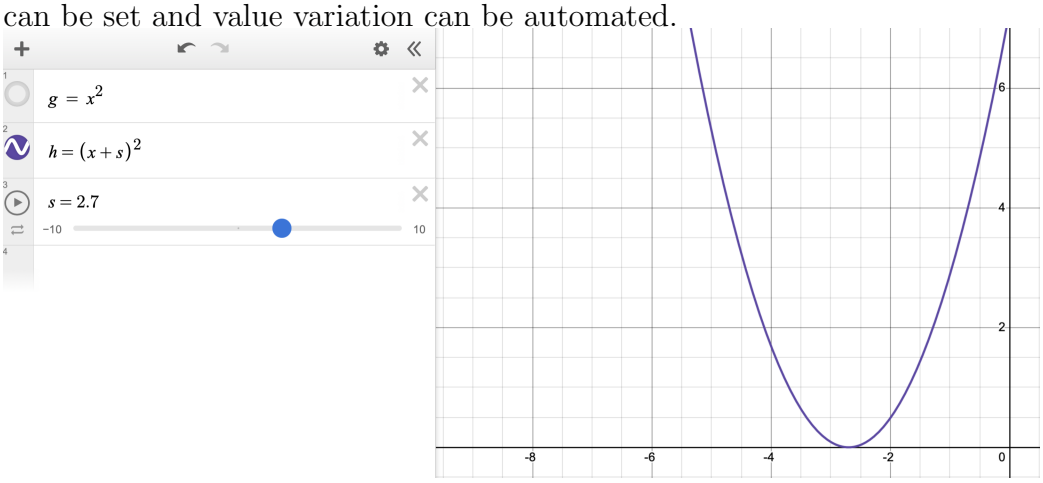


Scrolling (pinching on a tablet) zooms in and out. Adding $h = (x - 4)^2$ adds a second blue parabola 4 units to the right and blue.



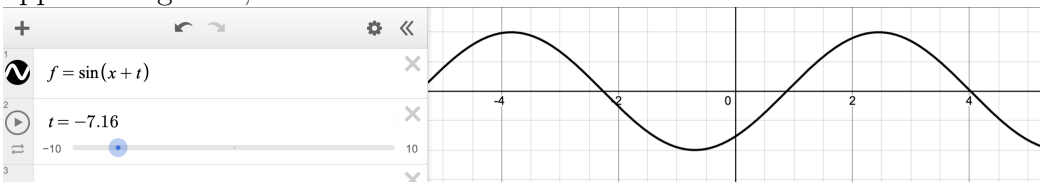
Click the symbol next to the graph name to show or hide it. A variable not indicated will require a new variable (e.g. s) that can use a slider. Bounds

can be set and value variation can be automated.

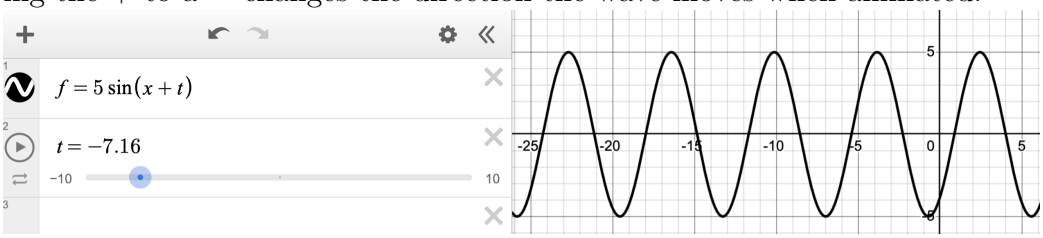


2 Exercise 2

The function $f = \sin(x + t)$ is a sine wave. As t increases, the function appears to go left, and vice versa.

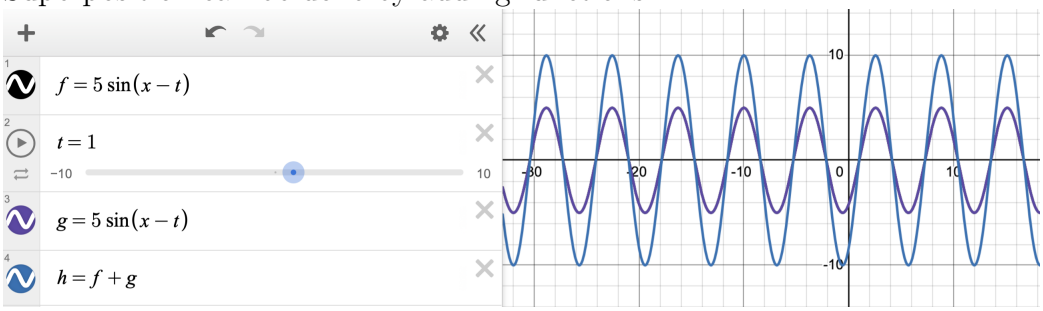


Switching to $f = 5\sin(x+t)$ increases the amplitude of the wave. Changing the + to a − changes the direction the wave moves when animated.

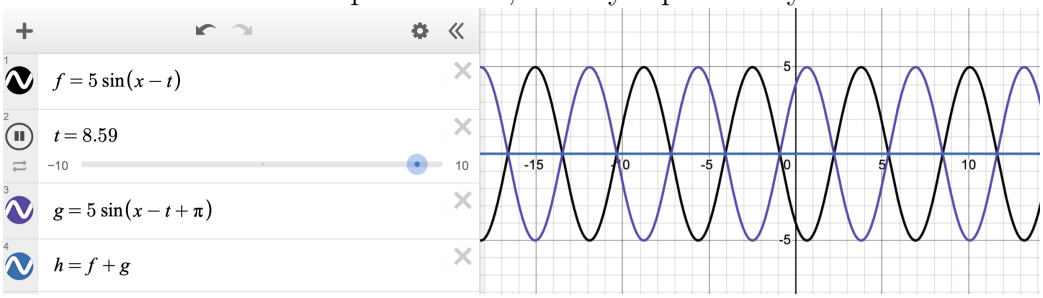


3 Exercise 3

Superposition can be done by adding functions.



Sine functions have a phase of 2π, so they repeat every 2π radians.



Constructive interference means waves work together for total value. Destructive interference means waves work against e/o.