

Variations in the Graph of the Sine Function

Michael Penna, Indiana University – Purdue University, Indianapolis

Objective

To illustrate the variations in the graph of the sine function.

Narrative

In this project, we investigate the variations in the graph of the sine function.

Task

1. Type the command lines below into Maple in the order in which they are listed. They produce a graph of $f(x) = \sin x$.

```
> # Your name, today's date
> # Variations in the Graph of the Sine Function
> # Task 1
> restart;                               Clear Maple's memory.
> f := x -> sin(x);                       Let  $f(x) = \sin x$ .
> plot(f(x), x=0..4*Pi);                  Graph  $f$  over the interval  $[0, 4\pi]$ .
```

2. Continue by typing the following command line into Maple.

```
> # Task 2
> plot({f(x), f(2*x), f(x/2), 2*f(x), f(x)/2}, x=0..4*Pi);
> plot({f(x), f(x+Pi/4), f(x-Pi/4), f(x)+Pi/4, f(x)-Pi/4}, x=0..4*Pi);
```

At this point, make a hard-copy of your typed input and Maple's responses. Then:

3. Label the curves in each of the plots you produced in Task 2. For example, label the graph of $f(x) = \sin x$ in each plot by " $f(x) = \sin x$ ". (If your hard-copy will not be in color, it might be useful to refer to the color output on your computer monitor when doing this labeling.)

Your lab report will be a hard copy of your typed input and Maple's responses (both text and hand-labeled graphics).