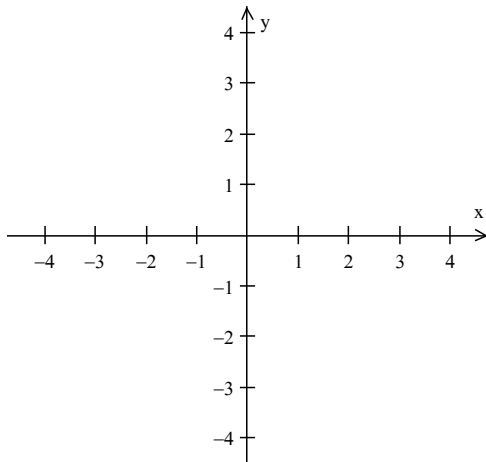


Complete the following questions by hand before you go to the computer lab. Show your work where appropriate and write the final answer in the space provided.

1. Let $f(x) = \begin{cases} x & \text{if } x < 1 \\ 2x & \text{if } x \geq 1 \end{cases}$. Sketch the curve of $y = f(x)$ over the interval $[-2, 2]$.



2. Find the exact value (no calculators) of $f(\pi/6)$ if $f(x) = x \sin(x)$.

3. If $f(x) = x^2 + 2x + 1$ find $f(a)$.

4. If $f(x) = x^2 + 2x + 1$ find $f(x+1)$.

5. If $f(x) = x^2$ find $f(f(x)+1)$.

6. If $f(x) = x^2$, $g(x) = x + 2$, and $h(x) = 1/x$, find and simplify:

(a) $f(g(h(x)))$

(b) $h(g(f(x)))$

7. If $f(x) = 1/x$, find and simplify $\frac{f(x+h) - f(x)}{h}$.

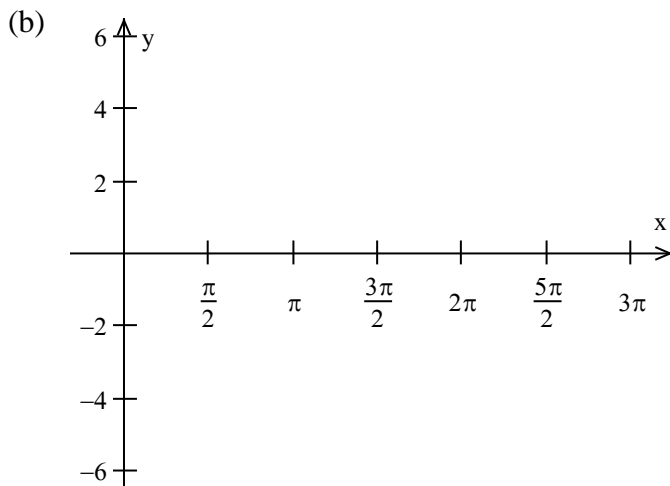
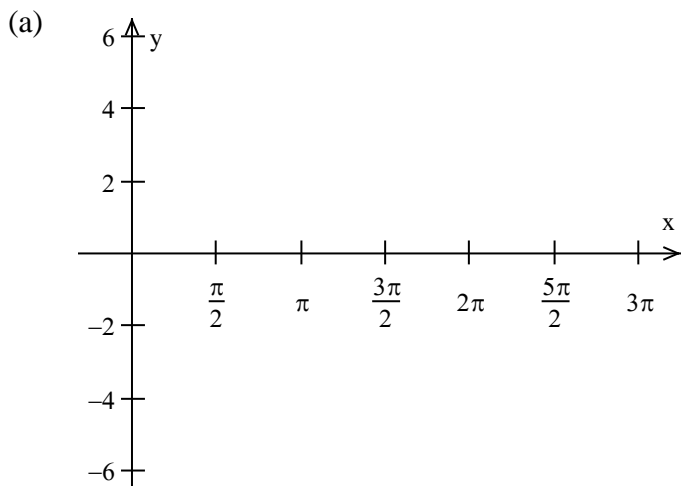
From the Math 100 index screen, click on “Functions.” Read the text explaining the commands. Type and execute the commands as you go. Continue until you reach the end of the sheet. Be sure to execute all commands in sequence. At the end, you may look at the optional examples or start on the last command line after the optional examples to answer the following questions.

- Write the exact Maple command syntax for:
 - (a) the rule that takes an input to the third power. > _____
 - (b) the command which applies the rule in part (a) to the number 2. > _____
 - (c) the command that gives the rule in part (a) the name f . > _____

- Write the exact Maple command syntax for
 - (a) defining $f(x) = x^2$, $g(x) = x + 2$, and $h(x) = 1/x$.
 > _____ > _____ > _____
 - (b) composing f , g and h (possibly using a function more than once) to get $\frac{1}{(x+2)^2 + 2}$.
 > _____

- Give the sequence of Maple commands, as well as the final output, for defining $f(x) = 1/x$, forming the difference quotient $\frac{f(x+h) - f(x)}{h}$, and then simplifying this difference quotient:
 > _____
 > _____
 > _____

- Plot (a) the graph of $y = 2 \sin(x) + 4 \cos(x)$ and (b) the graphs of both $y = 2 \sin(x)$ and $y = 4 \cos(x)$ together on the same grid. Get Maple to plot using the same domain and range as the grids. Include the Maple command syntax and for part (b) label each curve on the graph.



> _____ > _____