Review 1 (Lessons 1-3)

Instructions: Create a tex file containing the items below so that they appear in pdf format exactly as this project file (for example, in-line mode, display mode, numbering...). Submit your tex file to teprice@uakron.edu. The name of your file should be of the form **yourlastnameR01.tex**. All calculations should be done using the CAS in SWP.

You can create an unnumbered section by using the properties for a section. To do this place the cursor just before the word Review in the section heading, click the properties button (magnifying glass), and choose unnumbered. Your document should be in 12 point font. You can ensure that you have this font size by navigating to Typeset $\longrightarrow$ Options and Packages $\longrightarrow$ Class Options $\longrightarrow$ Modify.

Create the following numbered list (a numbered list can be constructed using the Item Tag menu):

1. Let A and B be sets. Then A is a subset of B, written $A \subset B$ or $A \subseteq B$, if every element x in A is also in B. That is, if

$$x \in A \Longrightarrow x \in B$$

2. If A and B are sets and $A \subset B$ but there is an $x \in B$ such that $x \notin A$ then A is a proper subset of B and we often write

$$A \subsetneqq B \quad \text{or} \quad A \subsetneqq B \quad \text{or} \quad A \subsetneq B \quad \text{or} \quad A \nsubseteq B$$

(Do you see the difference between each of these?)

3. If a and b are real numbers with a strictly larger than b we write

$$a \gneqq b \quad \text{or} \quad a \gneqq b \quad \text{or} \quad a > b$$

However, if $a \not< b$ the we write

$$a \geq b$$

to stress the point that a may equal b.

4. We often associate mathematical expressions using parentheses, brackets, and so on. For example, we my write

$$\left\{\left[\left(\frac{a}{b}\right)^2+\left(\frac{b}{a}\right)^3\right]^4-\left[\left(\frac{a}{b}\right)^2-\left(\frac{b}{a}\right)^3\right]^4\right\}^5$$

Notice that parentheses, brackets, and so on created using the buttons "grow" with the size of the expression they contain. Direct entry using the keyboard will not produce such expressions. For example,

$$(\frac{a}{b})$$

However, using control right (or left) parenthesis produces

$$()$$

an expression which grows to fit what it contains.

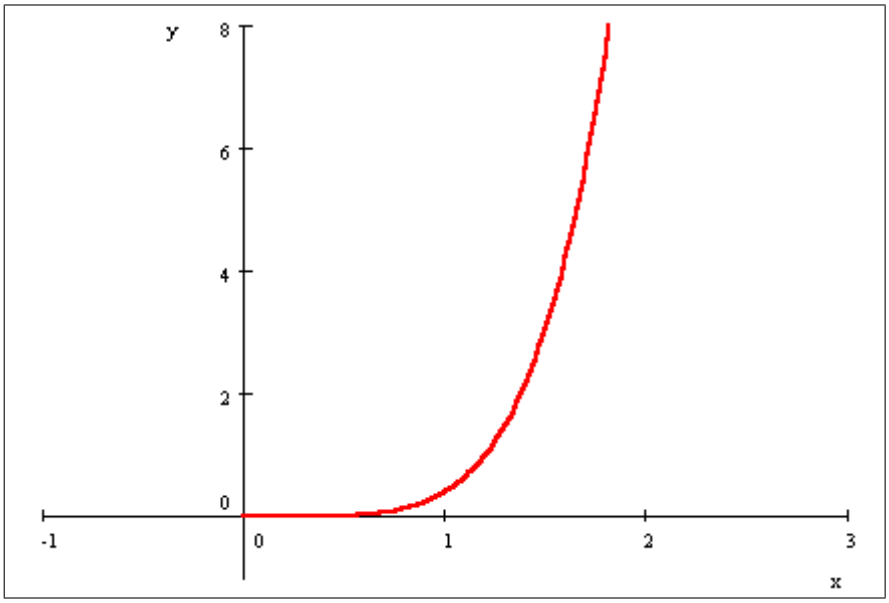
5. Sometimes expressions are decorated:

$$\widehat{a+b} \text{ or } \widetilde{a-b}$$

Decorations can be combined to produce expressions of the form

$$\overbrace{a\cdot a\cdot\cdots\cdot a}^{n\text{-factors}} \text{ or } \underbrace{a\cdot a\cdot\cdots\cdot a}_{n\text{-factors}}$$

6. The figure below is a sketch of the graph of $g(x)=\int_0^{x^2} t^{3/2}dt$



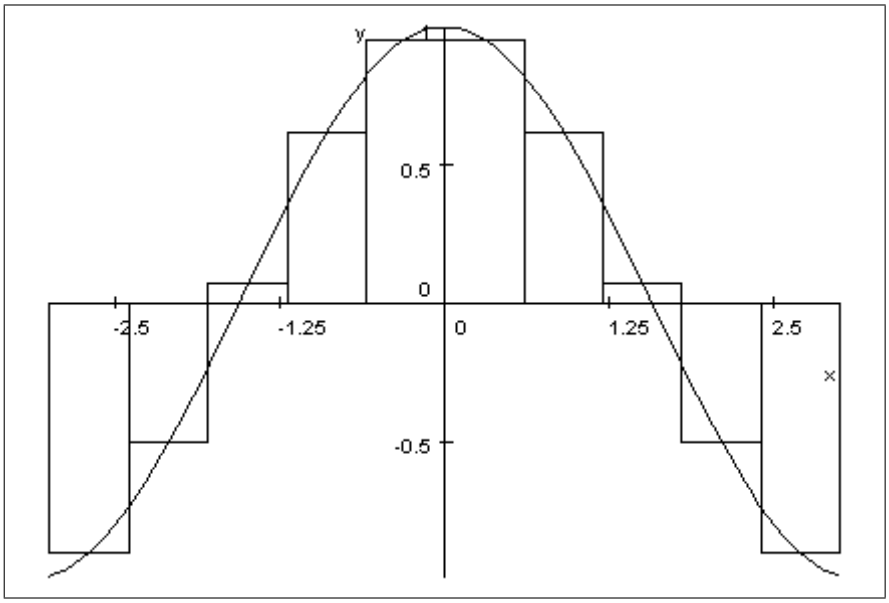
A special plot

for $x \in [0, 2]$. You may want to review the **Plot Properties for 2D Plots** portion in the help menu.

7. Use the CAS in SWP to calculate

$$\frac{d}{dx} \int_0^{x^2} t^{3/2} dt = 2x \left(x^2\right)^{\frac{3}{2}}$$

8. Let $f(x) = \cos x$. By navigating through the menus Compute $\longrightarrow$ Calculus $\longrightarrow$ Plot Approximate Integral, generate the figure below.


y
1
0.5
0
-0.5
-2.5
-1.25
0
1.25
2.5
x