Head	Head	Head
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Table 1: Table Caption

1 Lesson 4: Fragments, Definitions, Automatic Substitution, and Math Names

Fragments can be used to enter several lines of text, formatting, and/or mathematics. For example, we can create a floating table using and existing fragment. (*enter the table fragment here*)

Often we want to create our own fragments. As a simple example we will create a fragment that produces the following environments:

Example 1 ***Solution 2***

Example 3 ***Solution 4***

Example 5 ***Solution 6***

When writing exams I may create the fragments

Exercise 7 *Compute* $\int dx$

Solution 8

$$\int \left(4x^2 - 7x + 1.0\right) dx =$$

Mathematical definitions are also useful. For example, I can define $f(x) = 4x^2 - 7x + 1$. Next, I use the fragment `myint.frg` and the function $f(x)$ to generate the problem...

$$f'(x) = 8x - 7$$

I use Automatic Substitution all the time. For example, to enter $\geq$ into a document you can use the menu item to the left (on my display). However, when I type *ge* in math mode I get $\geq$. Likewise,

Example 9 *To create an automatic substitution for the symbol* ✓ *we us the go to the tools menu and select Automatic Substitution.*

Math Names can be especially useful. Examples include

We can create our own math names. Let's create the math name a1, f1, and f2 b3 b6 b6

Example 10 *Define* $\mathrm{f1}(x) = -3x^2 + 1$ *and write* $f(x) = \mathrm{f1}(x)$ *. Now set* $\mathrm{f2}(x) = x\cos x$ *and write* $f(x) = x\cos x$

2 Project 4

Instructions: Create a file containing the items contained in this document. Submit .tex and. pdf versions of your file to teprice@uakron.edu. The name of your files should be of the form **yourlastname04.tex** and **yourlastname04.pdf**. All calculations should be done using the CAS in SWP.

Exercise 11 *Define a fragment that generates*

$$\sum_{\mathrm{n1}=0}^{\infty} a_{\mathrm{n1}} x^{\mathrm{n1}}$$

Note that your fragment should be in display mode and that n1 *is a Math Name.*

Exercise 12 *Make your Math Name an Automatic Substitution and write the following sum.*

$$\sum_{\mathrm{n1}=1}^{10} \sqrt{\mathrm{n1}}$$

Evaluate this sum.

$$\sum_{\mathrm{n1}=1}^{10} \sqrt{\mathrm{n1}} = \sqrt{2} + \sqrt{3} + \sqrt{5} + \sqrt{6} + \sqrt{7} + \sqrt{8} + \sqrt{10}$$

Exercise 13 *Generate a fragment of your choosing and place it here:*

Exercise 14 *Use the Define tool to define the function*

$$\mathrm{g1}(x) = \frac{e^x}{10}$$

Next. type $g(x)$ *and with the indicator located somewhere in this expression use the plot tool to graph g. Include the label: Graph of g*

Exercise 15 *Generate at least two Automatic Substitutions of your choice and include them in this document. For example,* Heaviside