MATH 1351 TI-85 EXERCISE XIV
The TI-85 and the area under a curve

Name: _____ SID: _____

Graph the function **y = -(1/3) x^2 + (1/3) x + 2** in the **ZDECM** viewing window. The following instructions are intended to show how to use the TI-85 to compute the area bounded below by the x-axis and above by the graph of a positive function.

From the **GRAPH/MATH** menu choose **f(x).** TRACE is automatically activated. *Left arrow* over until the x-coordinate is -1 and press **ENTER**. This sets the lower bound (left endpoint). Next *right arrow* over until the x-coordinate is 2. Pressing **ENTER** now has the effect of setting the upper bound (right endpoint) and computing the area, which is displayed in the lower left corner of the screen. So what is the area under this curve, above the x-axis, between x = -1 and x = 2 ? _____

Just for fun, let's see how to shade in the region whose area we have just calculated. From the **GRAPH/DRAW** menu select **Shade.** The expression **Shade(** should appear on the screen, with the cursor asking for input. So provide input so that the expression appears as follows:

Shade(0 , y1 , -1 , 2)

and press **ENTER.** (Recall that the variable **y1** can be found by choosing **2nd VARS** from the keyboard, then **EQU** from the screen menu.) What is the effect of these procedures? _____

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Choosing **CLDRW** form the **DRAW** menu will erase all drawn stuff and graph the function again. Try it.

In general the expression **Shade(f(x), g(x), a, b)** has the effect of shading that portion of the viewing window that is above the graph of f(x), below the graph of g(x), and between x = a and x = b.

What is the area of the region above the x-axis and below our graph
1) between x = -2 and x = 2?_____ 2) between x = 0 and x = 3? _____
3) between x = 1 and x = 2? _____ 4) totally? _____

What do you obtain if you set the lower bound at
1) x = -3 and the upper bound at x = 2? _____ 2) x = - 3 and the upper bound at x = -2?____

In general the command **f(x)** will compute the net area between the graph, the x-axis, and the lower and upper bounds for x. By "net area" we mean the area above the x-axis minus the area below the x-axis.

Use this feature to determine the net area for **y = sin (Pi x)** from x = 0 to x = 2. What do you observe? _____
Is this answer reasonable from looking at the graph of **y = sin(Pi x)** ? _____ Explain._____

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