



## Teacher Notes for Integrals

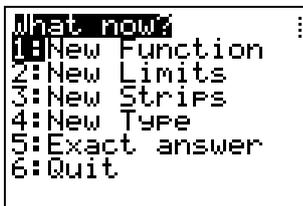
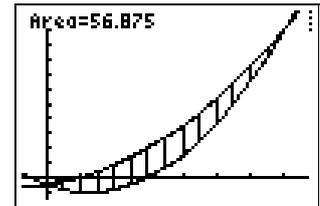
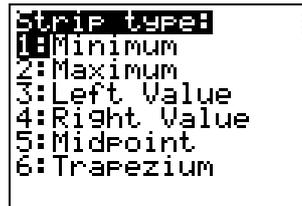
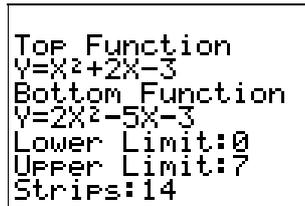
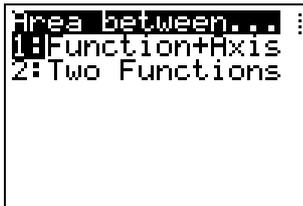
Compatibility: TI-83+/83+SE/84+/84+SE

Run The Program Called: **INTEGRAL**

### ► Summary

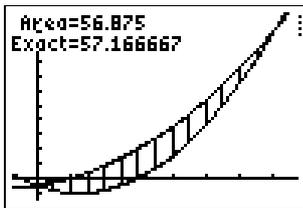
This program provides a graphical display and numerical answers for areas under and between functions. It proves to be highly effective in supporting students' early work on the topic of definite integration.

### ► Features



After the display of the approximation of the integral, the user can return to amend any of the options chosen, as well as view the “exact” answer.

The “exact” answer is still a numerical approximation, but to a higher degree of accuracy (and speed) than the strip simulation provides. [it uses the calculators **fnInt**( in-built command)]



### ► Suggestions

This program has an obvious place in lessons when introducing definite integrals to students. It supports and emphasises the link between a definite integral and a graphical image of the problem - students can quickly obtain an image of the problem without being distracted by having to draw the graph themselves.

By increasing the number of strips from, say, 20 to 100, students can see the improvements made to the accuracy of the answer when more strips of smaller width are applied to the problem. Both the Trapezium Rule and infinite limits are all within conceptual reach from this starting point.

The program can also be used by students to check their answers to definite integral questions of all sorts - not just their answer, but also their diagrammatic interpretation of the problem.

Furthermore, tackling problems involving areas between two curves before those that are between a curve and the x-axis has proven benefits. Once students are happy with the concept of “lengths of strips” between functions, they quickly see that the area between a function and the x-axis, is really a simple version of the two-function problem, with one of the functions being zero.

Furthermore, they easily see why areas under the x-axis are negative, by consideration of which function is at the “top” and which is at the “bottom”.