

[Return to List of Lessons](#)

Calculator Lesson 17

Antiderivative

In Lesson 14 we learned how to find the definite integral on the calculator. In this lesson we will learn to find the indefinite integral, or antiderivative. The calculator's ability to compute indefinite integrals is somewhat more restricted than definite integrals. It will do indefinite integrals only with respect to the default variable shown in the middle at the top of the screen. This should be 'X' unless it has been changed. Also, the calculator must be in exact mode and system flag 3, the function flag, must be set off to symbolic. Recall that we can toggle between exact and approximation mode by pressing RS(hold) > ENTER. To make sure system flag 3 is set correctly, press MODE > F1-FLAGS. If flag 3 is checked, scroll down to it and press F3-CHK to uncheck it. To change the default variable, press MODE > F3-CAS. The top item, Indep var, is the default variable and can be changed to any desired variable name. If it is not set to 'X', change it to 'X' for the purpose of the example that follows.

Suppose we are interested in finding the indefinite integral $\int 6tx dx$. Using either the equation writer or the command line, place the algebraic object $6 \cdot t \cdot X$ on the stack. Now press LS > CALC > F6-INTVX. The result should be $6 \cdot t \cdot \frac{1}{2} \cdot X^2$. Notice that the calculator does not supply the arbitrary constant C . That is left to the user. If you now press EVAL, the result will be simplified to $3 \cdot t \cdot X^2$. Now go into the CAS directory as indicated above and change the default variable to 't'. Put $6 \cdot t \cdot X$ on the stack again and repeat the commands LS > CALC > F6-INTVX. Now the result will be $X \cdot 6 \cdot \frac{1}{2} \cdot t^2$, and after pressing EVAL it will be $3 \cdot t^2 \cdot X$. As we can see from this example, the INTVX command will always find the antiderivative with respect to the default variable.

[Return to List of Lessons](#)