Matlab's symbolic toolbox (function library) can be used to do analytical integration.

This example is from CRE Notes 04 integration, at ReactorLab.net, Resources

$$\frac{dx}{dt} = k(1-x)$$

Separate variables

$$\frac{dx}{(1-x)} = k\,dt$$

Integrating the right side is trivial. Use Matlab to integrate the left side.

In Matlab, declare x as a symbolic variable. Then integrate to obtain the indefinite integral.

```
>> syms x
>> int(1/(1-x))
ans =
-log(x - 1)
```

We can also get the definite integral for integration between specified initial and final values of x

```
>> syms x
>> int(1/(1-x),0,0.5)
ans =
log(2)
```

This is the symbolic answer from the symbolic toolbox.

We can then use the standard function log to evaluate this result. In Matlab, as in WolframAlpha, the natural logarithm ("ln") is "log." Log to the base 10 is "log10."

```
>> log(2)
ans =
 0.6931
```