

# INTEGRATION

*This resource was written by Derek Smith with the support of CASIO New Zealand.  
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The calculator can integrate at values of  $x$  only  
i.e. a lower bound and an upper bound is required



Use the calculator in RUN mode.

Entry by: OPTN key then F4 key



The integral finds the area under the curve.

[Note: that areas below the  $x$ -axis are negative values and areas above the  $x$ -axis are positive]

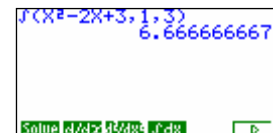
## Example 1:

Find the integral of  $y = x^2 - 2x + 3$  between  $x = 1$  and  $x = 3$

Pressing the F4 brings up the dx function

Type in the equation to be integrated

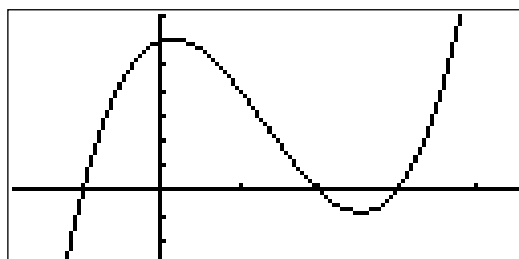
Press EXE to get the value



## Example 2:

Find the **area** between the curve  $y = (x + 1)(x - 2)(x - 3)$  between  $x = -1$  and  $x = 3$

A quick pencil sketch of the graph is helpful here.

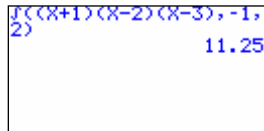


### Solution Method 1:

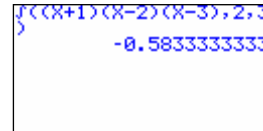
So we need to do the integration in two parts:

That is, find the integral of  $y = (x + 1)(x - 2)(x - 3)$  between  $x = -1$  and  $x = 2$

And also find the integral of  $y = (x + 1)(x - 2)(x - 3)$  between  $x = 2$  and  $x = 3$



```
J((X+1)(X-2)(X-3),-1,2)
11.25
```



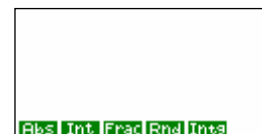
```
J((X+1)(X-2)(X-3),2,3)
-0.5833333333
```

Then add the two positive answers together

### Solution Method 2:

Using the absolute value function [All of the graph is above the x axis]

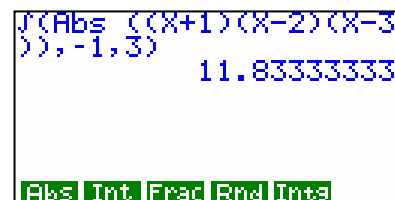
Entry by: OPTN key then F6 key and then F4 key



Type in the equation to be integrated,

i.e. of  $y = \text{Abs}((x + 1)(x - 2)(x - 3))$  between  $x = -1$  and  $x = 3$

Press EXE to get the value



```
J(Abs((X+1)(X-2)(X-3)),-1,3)
11.83333333
Abs Int Frac Rnd Inta
```

For further tips, more helpful information and software support visit our website  
[www.monacocorp.co.nz/casio](http://www.monacocorp.co.nz/casio)

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