

## On the Subject of Calculus

Lets be honest. Calculus is stressful for everyone. What's new is that it's on a bomb, as if it couldn't get worse.

Calculus modules are broken into three parts:

- The Equation: This can have 2-3 monomials.
- The Answer Field: Answers can range from -9 to 9.
- The Input and Submit Buttons.

5X 2	KX 2	FX 2	O
ANS	0X 3		
UP	DOWN	SUBMIT	

## Hidden Variables

Each equation given above can have 1-2 hidden variables. These variables can be found using information gathered from the side of the bomb, such as batteries, labels, and ports. Each possible variable is listed below.

- If the equation has the variables Z or B, replace them with the number of batteries on the bomb.
- If the equation has the variables F or R, replace them with the number of labels.
- If the equation has the variables M or K, replace them with the number of port panels, **NOT** the number of ports.

Additionally, if the two variables' sum is greater than 9, divide both variables by 2. If not a perfect divide, round down.

*Example:  $5 / 2 = 2.5$ . The new variable is 2.*

## Types of Problems

There are two types of problems shown on a module: Finding Integrals and Finding Derivatives. To determine the type of problem, check the degree of the base equation and the answer equation.

- If the degree of the answer is bigger than the base equation, solve with integration.
- Otherwise find the derivative of the base equation.

## Entering an Answer

Enter an answer by changing the constant in front of the answer equation using the up and down arrows. If the constant should be a decimal, round it down.

Finish by pressing the "Submit" button.

In case you've never taken a calculus class before, below is a basic description of how to solve each problem.

*NOTE: The instructions below only apply if you combine all terms of the base equation after finding the hidden variables.*

## How to Find Derivatives

	Base Equation	Example
<b>Step 1</b>	Prepare Equation: $ax^b$	$5x^3$
<b>Step 2</b>	Multiply Constant by Degree: $(a*b)x^b$	$15x^3$
<b>Step 3</b>	Decrease degree by one: $(a*b)x^{(b-1)}$	$15x^2$
<b>Step 4</b>	Repeat steps 1-3 for remaining monomials.	

## How to Solve Integrals

	Base Equation	Example
<b>Step 1</b>	Prepare Equation: $ax^b$	$6x^2$
<b>Step 2</b>	Increase degree by one: $ax^{(b+1)}$	$6x^3$
<b>Step 3</b>	Divide by new degree: $ax^{(b+1)} / (b+1)$	$2x^3$
<b>Step 4</b>	Repeat steps 1-3 for remaining monomials.	

Additionally, if you would like to check your answer, use it with the other type of problem and you should get the original base equation.

*Example:  $6x^2$  undergoes integration to become  $2x^3$ . When finding the derivative of  $2x^3$ , it becomes  $6x^2$ .*