

On the Subject of Calculus

Lets be honest. Calculus is stressful for everyone. What's new is that its 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			<input type="radio"/>
ANS		<input type="text" value="0X 3"/>	
<input type="button" value="UP"/>		<input type="button" value="SUBMIT"/>	
<input type="button" value="DOWN"/>			

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

How to Solve Integrals

	Base Equation	Example
Step 1	Prepare Equation: ax^b	$6x^2$
Step 2	Increase degree by one: $ax^{(b+1)}$	$6x^3$
Step 3	Divide by new degree: $ax^{(b+1)} / (b+1)$	$2x^3$
Step 4	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 $6x^2$.