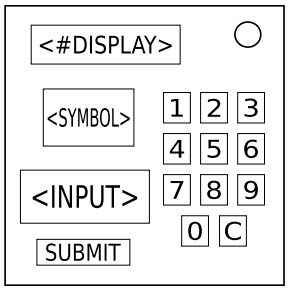
On the Subject of Equations X



You have either tried to escape them, or you need to use them every single day... Whatever the case they are here now!

This module has a display for a number pattern, symbols, and user input. It also has a keypad for entering values into the input screen, a clear button, and a submit button.

To solve this module the defuser must enter in the correct number which is the answer to an equation given by the symbol and number pattern display. To get from the provided information on the displays to the answer, you must follow the step-by-step process below.

If the defuser submits the wrong number into the module, a strike will be recorded but the module will NOT reset.

Step 1:

Find the corresponding symbol from the symbol display below and take note of the equation it relates to.

Symbols*	Equations**
Torque	$r \times F$
Kinetic Energy	$^1/_2 mv^2$
Power	$F \cdot v$
Angular Velocity	$^v/_r$
Z of T	$\int(T + 3)dT$, C=2
Coefficient of Static Friction	$^{F_F}/_{F_N}$
H of T	$\int(T^2 + 4T)dT$, C=-5
Position	$\chi_{max}\cos(\omega T + \phi)$
Angular Acceleration	$(\omega - \omega_0)/t$
* - A symbol to word key is provided at the end of the manual.	
** - A equation help list is provided at the end of the manual.	

Step 2:

Find the corresponding symbol from the symbol display below and go through the rules, which may make changes to your symbol's equation.

Symbols*	Rules
Angular Velocity	• If there is an odd digit in the serial number, then subtract 5 from the equation. • If the bomb has both an unlit indicator CAR and unlit indicator IND, then flip the fraction in the equation.
Coefficient of Static Friction	• If there is exactly 2 batteries on the bomb, then divide the equation by $^{3}/_{7}$. • If there is a lit indicator NSA, then ignore the next rule. • If the bomb has a RJ-45 port, then add 1 to the equation.
Kinetic Energy	• If the bomb has 3 or more indicators, remove the $^{1}/_{2}$ from the equation. • If there is a "The Button" module, then multiply the entire equation by 3.
Torque	• If the bomb has an empty port plate and more than 1 battery, add 10 to the equation. • If there are at least 2 solved modules, then divide each term individually by 2. • If the bomb has a lit indicator FRQ, then skip the rest of the rules. • If there is a needy module, disregard all previous rules and use the original equation. • If the bomb has an unlit indicator BOB, then add 3 to the equation.
Z of T	• If the bomb has more than 6 widgets, then take the derivative of the integral.

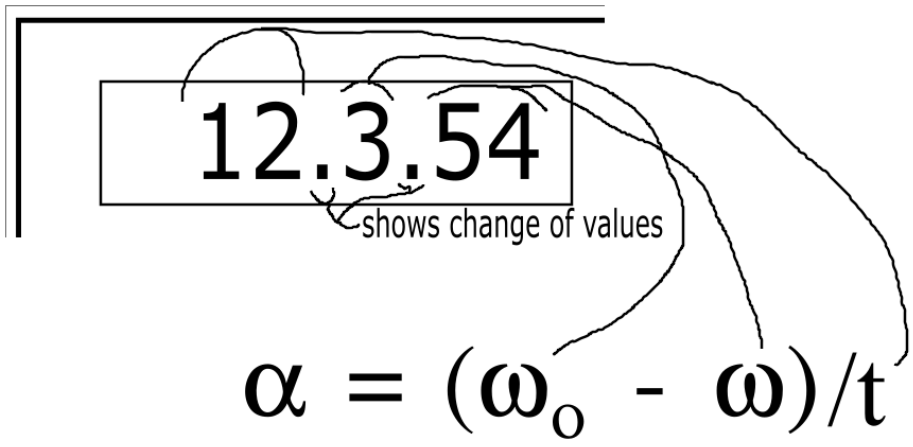
Power	• If there is a vowel in the serial number, then multiply the equation by $^{2}/_{3}$. • If the bomb has at least 6 modules, then add 14 to the equation. • If the bomb has a unlit indicator CLR, then turn any 3's in the number display to 4's.
Angular Acceleration	• If the bomb has at least 2 strikes, then press submit with the input display cleared. • If the bomb has a Stereo RCA port, then add 8 to the equation. • If there is a needy module, then multiply the equation by $^{1}/_{4}$. • If the 2 previous rules applied, then put "116" into the input display and press submit.
Position	• If there is a 5 or 3 in the serial number, then add 21 to the equation. • If there is a "Keypads" module, then turn any 5's in the number display to 8's. • If the bomb has ANY solved modules then change the cosine to a sine.
H of T	• If there is more than 5 batteries, then take the derivative of the integral. • If the bomb has a Parallel port, then change the "C" value to 8.
* - A symbol to word key is provided at the end of the manual.	

Step 3:

*Take the new equation and substitute all values from the number display into the variables** of the equation from left to right (anything in a fraction goes denominator first then numerator). If there is not enough variables** for each value, then use as many as you can. A diagram below shows how you identify the values from the display and an example of how to substitute them. Then calculate the answer to the equation applying the notes below and have the defuser input the answer into the module and press submit.*

- Answers to the equations are assumed to be absolute values of themselves.
- Decimal answers are rounded to the nearest whole number. For example... 2.5 would be 3 and 1.4999 would be 1.
- If an equation has a divide by zero in it then press the submit button with nothing in the input display.

** - The equation helper list also contributes to letting you know what is a variable and what isn't.



Helpful Tables/Lists

*Hey remember those helpful things *'s promised? Well here they are!*

*Symbols to Words Table

Symbols	Words
H(T)	H of T
P	Power
X	Position
ω	Angular Velocity
Z(T)	Z of T
τ	Torque
μ	Coefficient of Static Friction
α	Angular Acceleration
K	Kinetic Energy

**Equations Help List

- Any dot (·), x (normal), or number/variable right next to another is multiplication
- sine (sin), cosine (cos), and tangent (tan) are all mathematical operators, not variables
  - These functions can either be calculated in terms of radians or degrees, the module does it with degrees
- Anything with a subscript is a guaranteed variable
- Anything else that is not a number is probably a variable
- Integrals (∫)
  - The ∫ symbol and dT can be ignored
  - What's left is called the integrand, and each term can be treated separately
  - Modify each term using this format $^{a}/_{n+1}X^{n+1}$ where...
    - a = coefficient already in front of variable; n = current power of variable; X = the variable (in your case T, remember just a number is multiplied by T^0!
  - Bring the terms back to an equation and add the "C" term listed with the integral to get your new equation
- Taking the derivative is the opposite/reverse of integrating, so taking the derivative of an integral cancels the integration! (i.e. $\int(T^5 + T)dT$, C=-3 would just be $T^5 + T$ as the new equation)