FunctionID - Instructions

This program displays a graph, and then challenges you to deduce its equation. These functions are available: polynomials, rationals, trig functions, exponentials, and logs. You first choose the function and then select a specific example to display as a graph. The available numbers are shown in the option box. If you type anything other than the available numbers the computer will pick one at random for you. The best way to figure out how the program works is to play with it for a while.

- You can toggle the **grid** off and on and also toggle between two levels of **zoom**.
- Viewing the "**table of values**" will display (x,y) for -10 <= x <= +10.
- The program is available as an applet embedded in a webpage, or you can download it to your own computer and run it as a stand-alone program.
- Change the size of the graphing area in the applet version by clicking on the size tabs; in the stand- alone version, re-size the window.

Deducing the equation

To identify the equation, type the formula into the textbox at the bottom. The formula must be entered with a specific syntax or it will be identified as *incorrect*. Please read the following:

- Formulas must be written as "y= ".
- The following symbols are used for mathematical operations:
  ( ) = brackets
  + - = addition and subtraction
  / = division.
  Multiplication is understood by writing symbols adjacent to each other
  *e.g. y = 3x y= 2sin(3x) not: y = 3*x*
  ^ = exponentiation
  e^x = exponential function
  sin( ), cos( ), tan( ) = trigonometric functions (in radians)
  log( ), ln( ) = logarithms, base 10 and base e
  sqrt( ) = square root

- Polynomials must be written with the highest order term first: y=ax^4 + bx^3 + cx^2 ...
  Incorrect: y = 2-x Correct: y = -x+2
- Fractional coefficients must be written as fractions, not decimals.
  Incorrect: y = 0.5x^2 Correct: y = 1/2x^2
  This is to be consistent with things like y=2/3x which cannot be represented as an exact decimal.
- Coefficients must be written before variables
  Incorrect: y = x/2 Correct: y = 1/2x *which means y = (1/2) x*
  If you wanted y =1/(2x) you would have to use brackets.
- The BEDMAS rule for order of operations is followed, so adding ( ) when not needed will render the formula incorrect.
  Incorrect: y = 1/(x^2) Correct: y = 1/x^2
  These equations are the same, but since exponents have a higher precedence than division, brackets are not needed.
  As is expected, y = 1/x-2 is not the same as y = 1/(x-2) Both of these formulas are correct, but

they are different equations.

Incorrect: y = x^3/2 Correct: y = x^(3/2) or y = 1/2x^3
If you want y=x^(3/2) then brackets are required because of operator precedence (BEDMAS).
If you want y = (x^3)/2 you have to write the coefficient first.

- When there are two operators with the same precedence, evaluation proceeds left to right. Thus y = 1/2x means y= 1/2 * x i.e. y = 0.5x and not y=1/(2*x)

If you get the formula correct, the text-bar will turn green. You will not be able to edit the formula until you choose a new equation. If your formula is incorrect the text-bar will flash red for a second.

After 5 incorrect guesses, the formula will be displayed. This is done because the program does not parse the equation you type in and there may be multiple ways of writing the same correct equation. The program just matches what you type with the stored equation. If it is not an exact match, it assumes that it is incorrect when, in fact, your equation may be correct, just in an incorrect form.