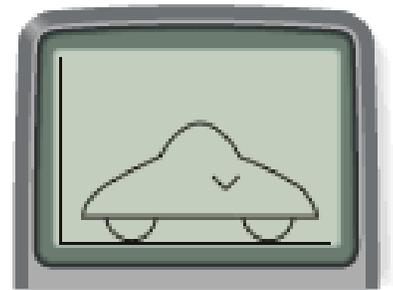


Introduction to Boolean Project

In his book *An Investigation into the Laws of Thought* (1854), the English mathematician George Boole (1815-1864) approached logic in a system that reduced it to simple algebra. In his system, later called Boolean algebra or symbolic logic, expressions are combined using "and" (multiplication), "or" (addition), and "not" (negative), and then interpreted as "true" (1) or "false" (0). Today, **Boolean algebra** plays a fundamental role in the design, construction, and programming of computers.

An example of a Boolean expression is $x \leq 5$. In this case, if x is 10, the expression is false and assigned a value of 0. If x is 3, then the expression is true and it is assigned a value of 1. You can use Boolean expressions to limit the domain of a function when graphing on your calculator. For example, the graph of $Y1 = (x + 4)/(x \leq 5)$ does not exist for values of x greater than 5, because your calculator would be dividing by 0.



Introduction - Car Parts (due ODD 11/17/09 EVEN 11/18/09)

1. Read the introduction on that is above.
2. Explore Boolean Expressions and Drawing Segments with your Graphing Calculator and the Calculator Notes 4G and 4H
3. Write down and explore what you think the functions are for the car in the program above.
4. Enter the program in your calculator (PRGM, NEW) and execute it (PGRM, EXEC) to get the drawing on your graphing calculator
5. You need to figure out what the functions are for the graphing calculator picture above are.
6. Please enter your functions into your calculator and test your program to see if it is the same picture as above.
7. Submit, on folder paper, a **write-up*** for the program which includes, for each line of code:
 - write the individual line of code - ex. DrawF $(2\sqrt{(x-4)}) / (x \geq 4) / (x \leq 8)$
 - write the equation given in the line of code and its domain - ex. $y = 2\sqrt{(x-4)}$; $4 \leq x \leq 8$
 - identify the parent function and transformations; use $f(x)$ notation - ex $f(x) = \sqrt{x}$
 - draw a thumbnail sketch of the function - include relevant values on the x and y axes
 - identify the part of the design that the line of code draws

EXAMPLE:

1. Line of code - DrawF $(-0.5(x - 5)^2 + 4) / (x \geq 3.5) / (x \leq 6.5)$
Equation - $y = -0.5(x - 5)^2 + 4$; $3.5 \leq x \leq 6.5$
Parent function - Quadratic $y = x^2$
Transformation - stretched by a $\frac{1}{2}$,
reflection over the x-axis
moved to the right five (5) units
moved up four (4) units

