

An Example:

Using the equation $P = I^2R$

Here are the steps to follow if you want to make a nomogram that will solve for Power (P) given values for Current (I) and Resistance (R), using the equation $P=I^2R$. The first thing to do is to know the type of expression you are going to use. Since this equation has exponents involved, we will choose the exponential expression.

File Remove Lines Help

Expression Setup Graph Labels Nomogram

Choose type of expression: Select...

Parameters

Constant to multiply by a: Select...

Constant to multiply by b: a X b = c

Value of exponent m: a + b = c

Value of exponent n: a / b = c

Value of exponent p: a - b = c

a^m X bⁿ = c^p

1

Name

Enter the names for variables a, b, and c (ex.: distance)

Name for variable a: A

Name for variable b: B

Name for variable c: C

Done

Now that you have the correct form chosen for the expression, you can fill in the text boxes for the values of the constants, the value of the exponents, and then give names to each of the variables.

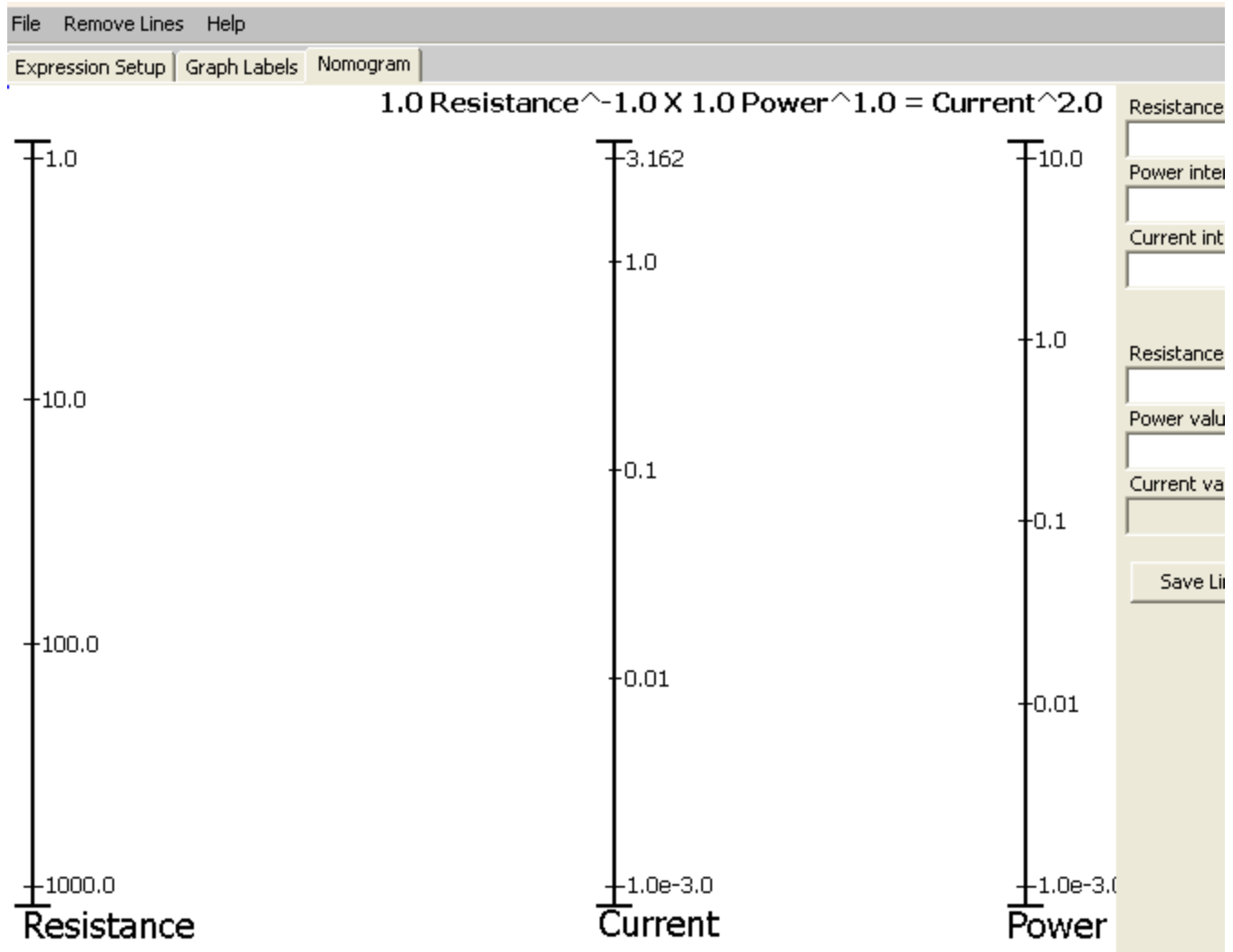
File Remove Lines Help	
Expression Setup	Graph Labels Nomogram
Choose type of expression:	a ^m X b ⁿ = c ^p
Parameters	
Constant to multiply by a:	1.0
Constant to multiply by b:	1.0
Value of exponent m:	-1.0
Value of exponent n:	1.0
Value of exponent p:	2.0
Name	
Enter the names for variables a, b, and c (ex.: distance)	
Name for variable a:	Resistance
Name for variable b:	Power
Name for variable c:	Current
Done	

The next step will be to enter in the units for each variable and the minimum and maximum values. Some hints about making sure your units are correct can be found by [CLICKING HERE](#). It is very important to make sure that for your scales the units are correct so that the tool is accurate. Another warning is to make sure that you enter different values for the minimum and maximum.

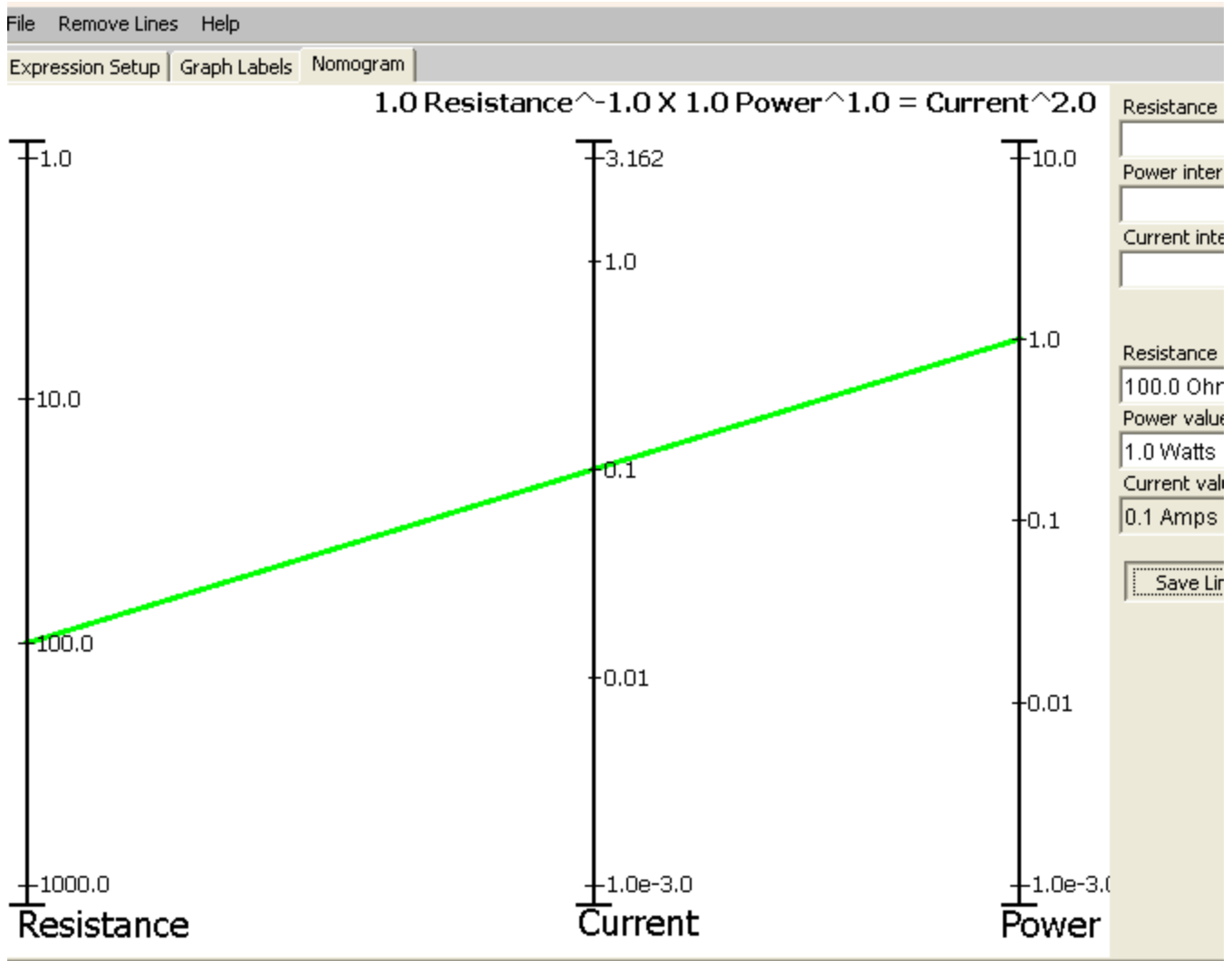
In this example, the minimum for resistance is 1 O, and the maximum is 1000 O. For Power, the min was 1 mW (or 0.001 W) and the max was 10 W.

File Remove Lines Help	
Expression Setup	Graph Labels Nomogram
1.0 Resistance^{-1.0} X 1.0 Power^{1.0} = Current^{2.0}	
Labels	
<i>The units that the variables are in (ex. kilometers)</i>	
Units used for Resistance	Ohms
Units used for Power	Watts
Units used for Current	Amps
Range	
Enter MIN value for Resistance	1.0
Enter MAX value for Resistance	1000.0
Enter MIN value for Power	0.0010
Enter MAX value for Power	10.0

Now, the nomogram is formed and ready to use. It will look like the following:



Now, the mouse can be used to draw a solution line across the nomogram, connecting the values of the resistance and power to find the current. In this first example, the resistance value is 100 Ω and the power is 1 Watt. If the exact value you had wanted when drawing the line was not hit, go to the text box and enter the correct value, and hit the "Enter" key.



With the first line drawn, it can be saved on the graph by clicking the "Save Line" button located under the value text boxes, which then keeps the line you have just drawn on the nomogram when a new line is formed.

Now, the first line is drawn and saved so a new one can be formed. For this line, the resistance value is 10 O and the power is 1×10^{-2} Watts, giving a current output of 0.032 Amps. At first the line did not connect at exactly 10 O for resistance, but 9.972 instead, so I entered 10.0 O in the text box, highlighted below, and the program moved the line.



Now there are two lines, but what if the second one is seen as unnecessary? It can be removed from the nomogram while keeping the first line in place. To do this, go to the top of the applet where it says "Remove Lines" and then click "Delete Last Line". Just be sure that the last line you want to remove has been saved. Otherwise a new line can be drawn and the previous will disappear.



Now, the previously drawn line is removed.

The user can also control the spacing of the ticks on the nomogram, by changing the value in the "Interval" text boxes. Here, I have entered 5 in the resistance interval.



Thus, you have made your first nomogram using the online interactive tool. If you have any questions or comments, please feel free to send them to [Professor Thomas B. Jones](#), [Allison Marrero](#), or [Ross Camara](#).

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Last updated by A. Marrero on 08/04/2003 11:50:55.