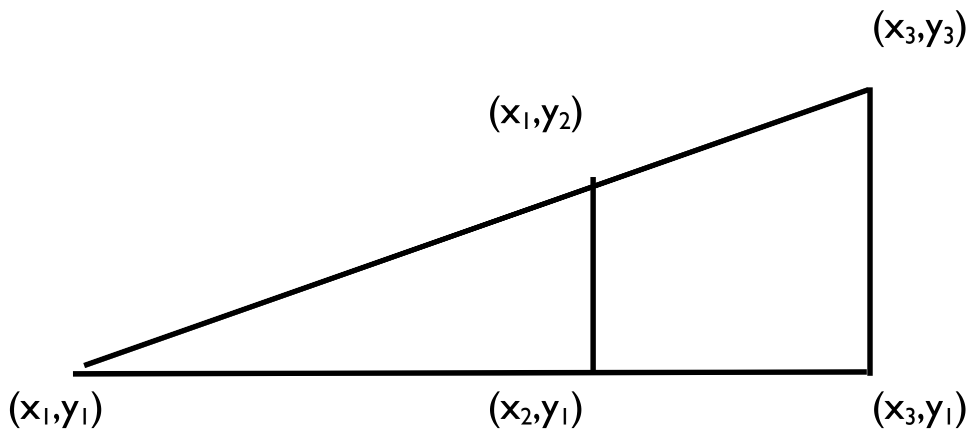
Linear Interpolation

Introduction

People who used log tables in the 1960's knew all about linear interpolation.

It was the last few columns on any set of log tables.



If a line joins (x_1,y_1) to (x_3,y_3) we assume this to be a straight line if it's short even if it's say a quadratic.

In many case the line really is straight.

We assume the gradient is constant so

$(y_2 - y_1) / (x_2 - x_1) \quad = (y_3 - y_1) / (x_3 - x_1)$

Hence $(y_2 - y_1) \quad = (y_3 - y_1) \times (x_2 - x_1) / (x_3 - x_1)$

And $\quad y_2 \quad = y_1 + (y_3 - y_1) \times (x_2 - x_1) / (x_3 - x_1)$

or say $\quad y_{intermediate} = y_{lower} + \delta y_{total} \times \delta x_{intermediate} / \delta x_{total}$

where δy and δx represent the changes in y and x respectively.

Don't try and "hoof" this.

Draw the diagram and label all the points clearly and then calculate y_2

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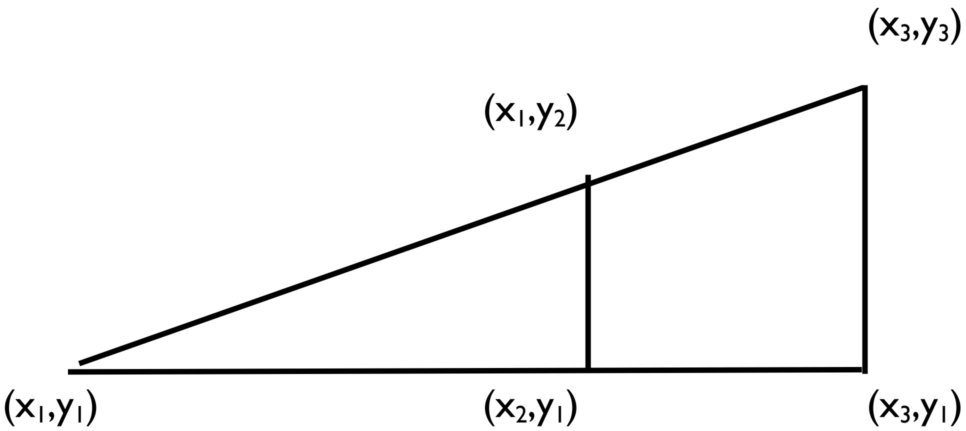

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