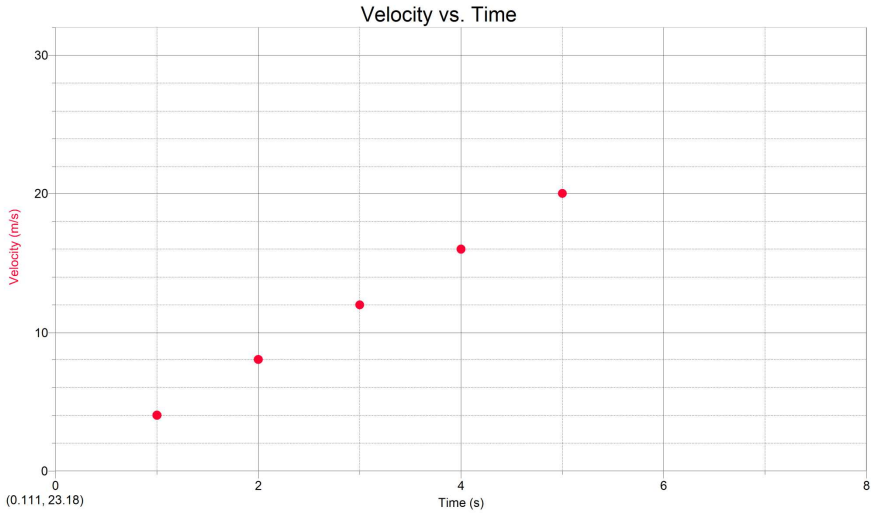
Graphing

Why Graph?

- In general, graphs combine data into clearly visible relationships.
- These relationships also help us predict the results of other situations, not yet tested.
- For example:

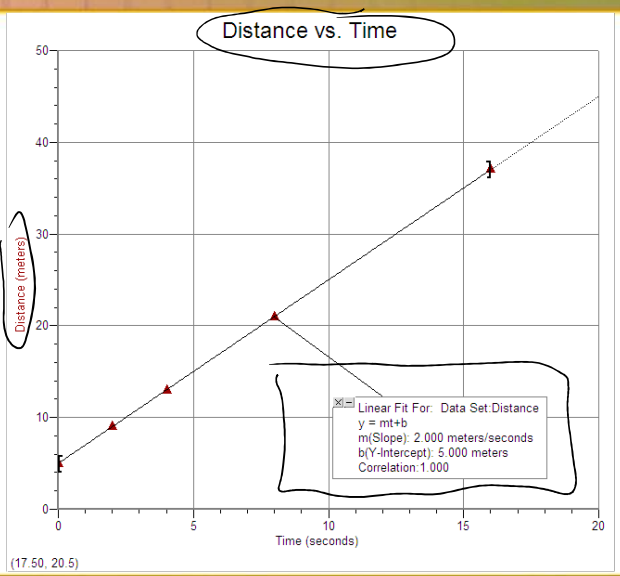
What speed would the car be going at 6 seconds? At 7 Seconds?



Parts of a Graph

- When grading graphs, I will look for:
  - Axes
  - Labels
  - Title
  - Data Points
  - Best Fit Line or Curve
  - Orientation

Using Graphical Analysis to Graph



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Axes & Variables

- If possible,
  - X-Axis
    - Independent Variable:

EXPERIMENTER CHANGES

  - Y Axis
    - Dependent Variable:

CHANGES AS A RESULT

- Sometimes, this does not give us a known relationship

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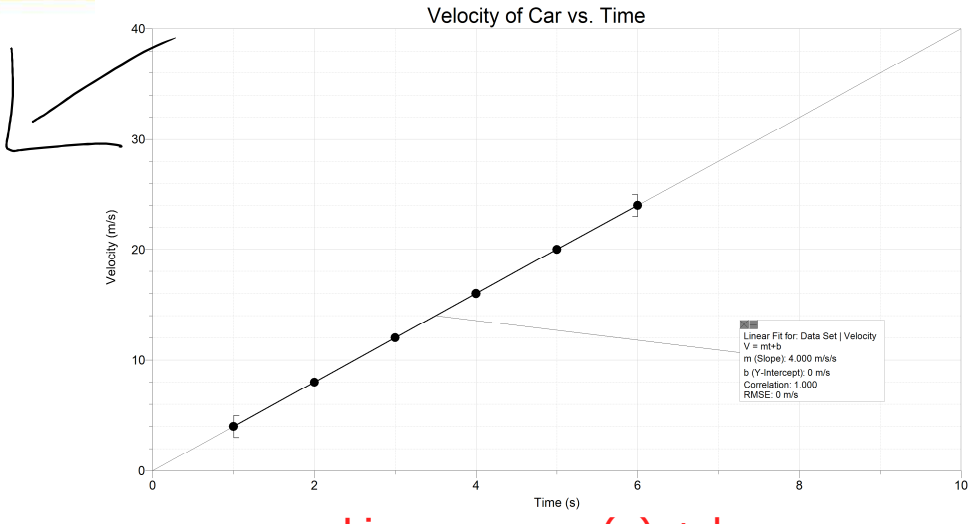
Variable Relationships - Generalizations*

- Direct Relationships
  - As one variable increases, the other increases
  - As one variable decreases, the other variable decreases
- Inverse Relationships
  - As one variable increases, the other decreases
  - As one variable decreases, the other variable increases

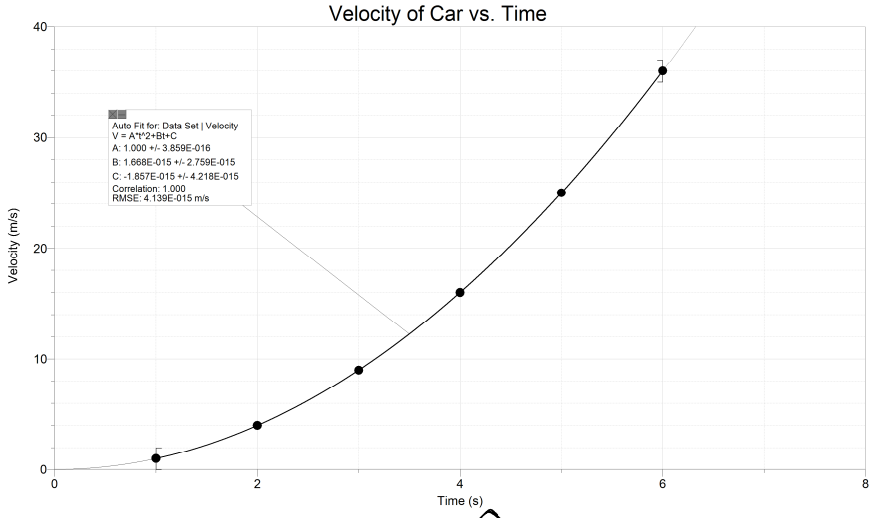
We will use more specific relationships in Physics.

Variable Relationships



Linear: y = m(x) + b

Variable Relationships



Quadratic: $y = A(x^2) + B(x) + C$

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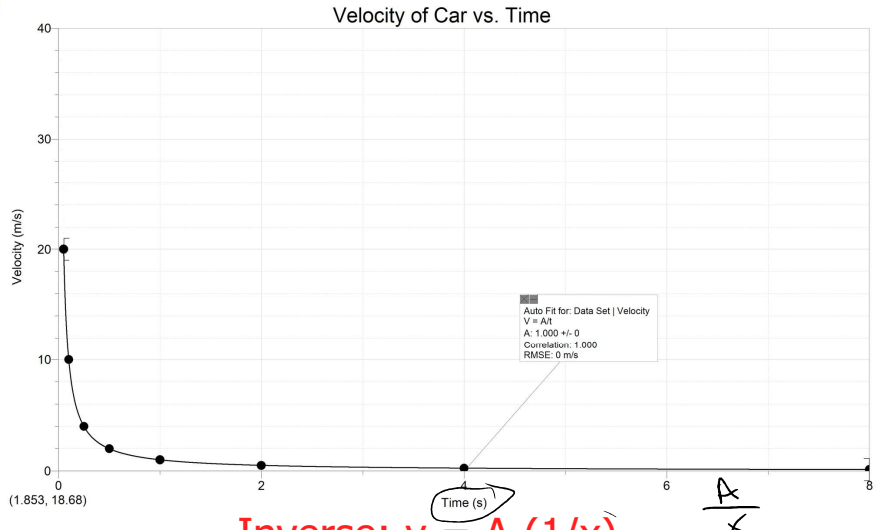
Variable Relationships



Inverse: $y = A\ (1/x)$

$\frac{A}{x}$

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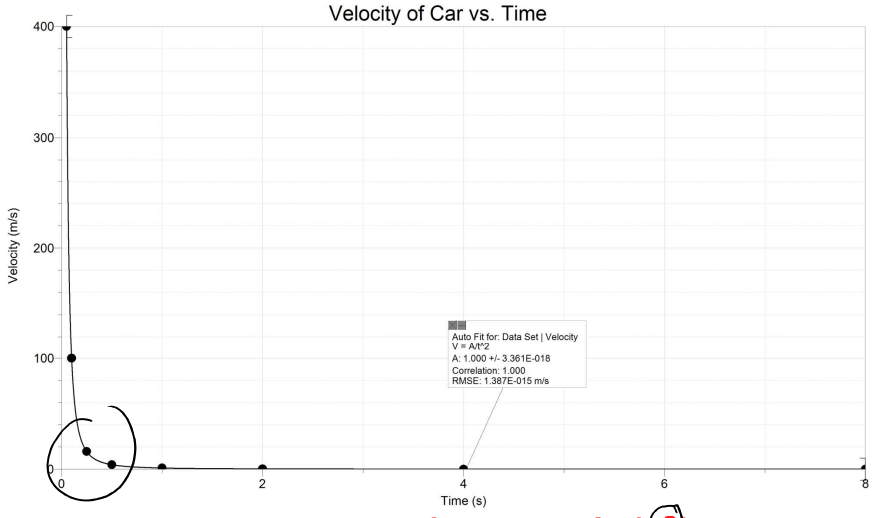
Variable Relationships



Inverse Squared: $y = A (1/x^2)$

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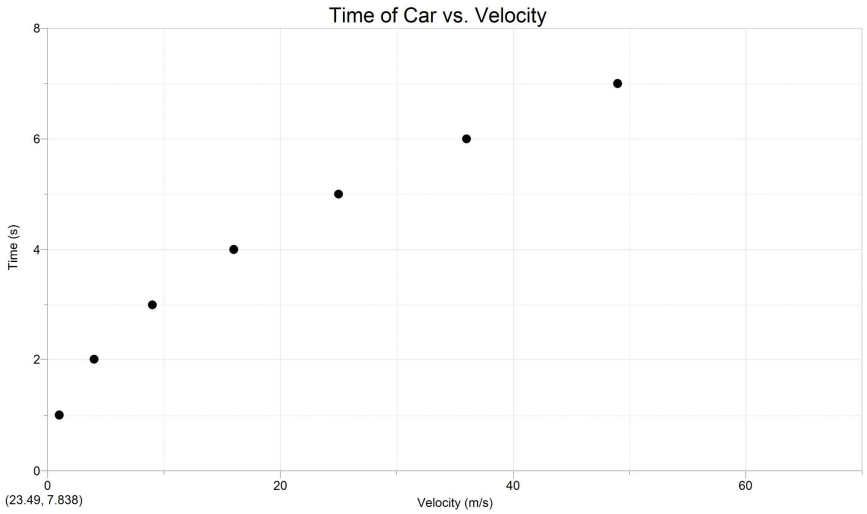
What relationship is this?



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Linearization of Graphs

- Linearization is the process of making a curved graph (inverse, quadratic, etc.) linear
- This is done by changing the x – axis to $1/x$, x^2, etc.
- This linear relationship makes it easier to write an equation that relates the variables.